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MEASURING BUSINESS RELATIONSHIP SUCCESS:

The Case of an Industrial Textiles Manufacturer

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**Measuring Business Relationship Success:
The Case of an Industrial Textiles Manufacturer**

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Abstract

This exploratory paper investigates why some companies appear to find successful business relationships relatively effortless. It seems that the organisation's search for and utilisation of key resources can guarantee its success in the market place. The paper incorporates a critique of literature from technology strategy, cross cultural management, and strategic management fields. The research questions, set by the author, are designed to explore the technological, managerial and cultural factors contributing to the success of the organisation and its further growth in the market.

The company on which this research is based in this research is a leader in the paper machine clothing industry - Albany International Corp. The search for key success factors contributing to Albany International's leadership position in the industry have been identified and analysed. Data have been collected through survey questionnaires, and have been used to develop a model designed to predict the success of business relationships in the paper machine clothing industry. Further investigation into relationships between variables has been carried out and a number of proposed dependencies are highlighted in the paper.

Key Words: Business Relationships, Culture, Technology, Mergers, Success

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Introduction

In today's collaborative, customer-driven, networked economy, forming and sustaining strategic business relationships with customers, suppliers and partners has become a mission-critical imperative for most businesses. That is, companies increasingly understand that to be successful they must focus on their core competencies and create collaborative networks of alliance partners to handle everything else. Yet, while the business need for alliance relationships has never been greater, most companies lack the ability to form successful strategic business relationships. The majority of literature on business relationships concentrates on factors associated with integration issues arising when companies develop relationships, including those of commitment and trust (Morgan and Hunt, 1994; Sako, 1992), cultural matters (Sinclair et. al., 1996), and problems of individual employees (Cameron and Freeman, 1988). These studies tend to concentrate on a number of industries, or are case studies of a particular organisation. However, there are no studies that have specifically looked at the technology intensive industries and their business relationship development.

This paper sets out to explore the nature of business relationships and attempts to measure their success using the findings from a study carried out on the paper machine clothing industry, which is generally represented by a small number of large firms competing in the marketplace. Paper Machine Clothing (PMC) is the product of this industry - a technical textile transporting belt - woven or nonwoven construction which is crucial to the papermaking process, as it covers the transporting cylinders in the paper machine and is used to produce the paper itself. A number of companies from the USA, Europe and Japan have been able to achieve leadership positions in the various product areas of this industry: forming, press, drying and transport belts product divisions. In order to achieve a leadership position the companies in the industry have to work very closely with their suppliers, as any innovations in materials can influence the success of the paper machine clothing manufacture, Since customers tend to have different paper machines with different specifications, the paper machine clothing that goes on to these machines has to be customised per customer requests; with competitors, as dependent on the investment into R&D and the IP rights that come from this, the leaders in product positions are able to allow the competitors to licence the PMC technology. The variety and levels of these relationships indicate the success of the PMC business. Hence the leadership position is identified as a measure of business relationship success in this paper.

The key issues examined in this paper are:

- Key success factors (i.e. organisational competences within the core business, its management and culture) contributing to the leadership of organisations in the paper machine clothing industry;

- Forms of business relationships (i.e. joint ventures, mergers and acquisitions) which are most beneficial to success;
- Key national differences in business relationship development and key points of influence of these on long-term success in the paper machine clothing industry.

A short literature review will illustrate some of the key concepts in the areas of business relationships, technology management and organisational culture, which the author has integrated as the key measurement elements of Albany International's success. The research methodology will be explained further in the paper, and the findings from the study will be presented.

Introduction into Strategic Business Relationships

Relationships between independent businesses have always been a part of the world's economic landscape. Relationships are becoming more and more intensive due to the interconnected nature of the global economy. Strategic alliances, joint ventures and research and development co-operation are commonplace in a large number of industries. The power and prevalence of relationships means that they are at the centre of decision-making in organisations. Deciding on the extent of co-operation has become a major strategic issue. Co-operating to compete is not only a feature of decisions concerning competitor and customer interactions, but also supply chain and managerial relationships with stakeholders such as employees, financial markets, governments and interest groups.

The origins of a relationship-based approach to the management of a firm emerged from academics and practitioners in the field of strategy, marketing and supply chain management. According to Christopher et. al. (1992) it appears to be a new way for marketing management to operate and is based on a managerial perspective that is part of a quest to make marketing more effective. In this context every customer is an individual, strong customer relationships are important for profitability, existing customers are more important than new ones and knowledge of the individual customer is paramount for the future direction of the business. To others, for instance Gronroos (1994), relationships are strategic so that interactive marketing becomes a question of strategy - the origins, development and its continuation is a strategic focus for the firm. Yet another approach is to view relationships as part of the drive for a more effective supply chain with the emphasis being on developing close relationships between channel partners; this will take costs out of transactions, and by implication, the entire supply chain. Relationships can also be strategic, but industry specific.

Transactions versus Relationships

A major distinguishing characteristic between types of exchange is whether they are based on a market transaction or a relational exchange, or are to some degree transactional and relational. The nature of these exchanges, their creation, maintenance and termination, is of crucial importance to the understanding of strategic market relationships. Suppliers can classify different types of customer relationships and must identify and manage their position on a spectrum between one-off sales, and their important long-term relationships. This is shown in Figure 1.

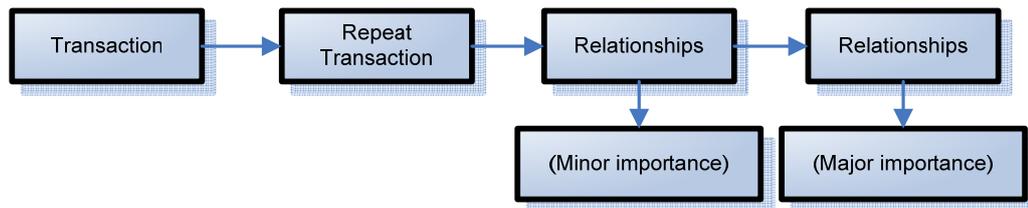


Figure 1 Behavioural spectrum of relationships (Jackson, 1985)

At one end of the spectrum is the transaction-based approach where little or no joint involvement is necessary or desirable. Products normally associated with the ‘hard sell’ approach are more likely to be considered transactions or, if a relationship exists, of minor importance. Transaction-based marketing appeals under market-type conditions. These transactions command little customer integration between organisations and a buyer should check around between different suppliers to obtain the best price and availability. Suppliers may try to offer incentives but these are unlikely to sustain a differentiation and can be copied by competitors, hence they must expect to win and lose business mainly on price.

However, for most purchases, it would be normal for some form of relationship to develop. Though this can be a repeated transaction in some cases, the relationship between buyer and supplier is of minor importance; while in other cases, the relationship, its longevity, quality and benefits are much more significant.

As Figure 1 demonstrates, it is appropriate to view the transaction/relationship approach as a continuum with a variety of positions being tenable and even desirable. This means that there are different types of relationships and we return to this issue throughout this paper. In some cases, for example where there is integrated design or joint development activity in a project, then suppliers must develop a closer relationship with the customer, adopt a long-term perspective, be strategic and tactical and highly account-specific (Wilkstrom, 1996). This will involve significant up-front investment and consistently good performance. Other research has shown that those firms who have close relationships with their suppliers are subject to more frequent and detailed analyses than firms who may maintain a more distant transaction-based exchange (Donaldson, 1996). The challenge is clear; only to invest in relationships

where the organisation is prepared to work, invest and promote continuing improvement or the business may be lost forever.

This paper focuses on the following types of business relationships: mergers and acquisitions, takeovers and joint ventures as vehicles for a company to gain a leadership position in its industry in the world market.

Traditional Management and Relationship Management

Managing the various relationships may place emphasis on managerial style and associated organisational culture. Companies using adversarial methods in dealing with one supplier might find it a challenge to change to a relationship approach. Organisations who pride themselves on their independence may find it difficult to pursue a strategy of co-involvement.

It is common knowledge that a buying organisation tends to have an overall style which affects all parties. One of the critical issues of managerial style is the need to match styles across organisations. Considerable pains need to be taken to select a partner that would be culturally compatible with one's own approach. Cultural compatibility should not be underestimated as many firms try to impose their culture on the partner firm (Sinclair et. al., 1996). Indeed, the social structure of a relationship has been the focus of early social exchange theorists (Blau, 1964) and of the Industrial Marketing and Purchasing Group's research (Håkansson, 1987), especially the concept of relationship atmosphere. Perhaps the most helpful concepts with which to work on managerial behaviour are the process variables — trust and commitment. These variables have been found to be key mediators of the strength of a relationship (Morgan and Hunt, 1994). Different levels of trust and commitment can signal alternative stylistic approaches whether partnership, friendship, adversary or detachment (O'Toole and Donaldson, 2000).

From a buyer's perspective, the reputation and size of the supplier as well as the characteristics of the salesperson may be indicative of trust. In addition, the willingness to make adaptations and investments can also signal trust (Doney and Canon, 1997). Levels of trust (Sako, 1992) include contractual (keeping promises), competence (perform role competently), and goodwill (willingness to do more than expected). These levels can be used to signal or withdraw trust or build a trustful reputation. Trusting behaviour is a potent tool of managerial intent and action.

With regard to commitment, this can be viewed as having two dimensions —input and continuance (Meyer and Allen, 1994; Gundlach et. al., 1995). The committed input will vary with type of relationship. For instance, some relationships may have idiosyncratic and dedicated resource investments and partners

may share proprietary information. Continuance commitment is reflected in the temporal intentions of the parties. Long-term orientation is a key feature of certain relationship types.

Strategic alliances are developed in order to achieve long-term strategic goals; as organisations agree to participate with role partners in order to be more effective in the supply and exploitation of a given market. The impetus for this is often to minimise transaction costs. In some cases these strategic alliances will develop into formal joint ventures, where the aim is to proceed in perpetuity. In reality, many strategic alliances have been shown to be short-term and questions arise about the wisdom of choosing only a few suppliers with which to do business.

Hence two of the key components to be included into analysis are issues related to developing commitment and trust between the organisations trying to build business relationships, The success of this activity will depend on how and what the host organisation has done either to retain, or what it has decided to change within the partner, and what effect the changes will have on the business as a whole.

Technology Management and Strategic Relationships

For the purpose of this paper it is important to note that the companies operating in technology intensive industries need to pay as much attention to the development of business relationships as any other organisations. In these organisations technology management becomes a part of the day-to-day activities; in some cases technology could be used as a basis for business relationship building.

The management of technology links engineering, science and management processes in the workplace therefore allowing organisations to plan, to develop and to implement technological capabilities as key strategic resources and to shape and accomplish the strategic and operational goals of an organisation.

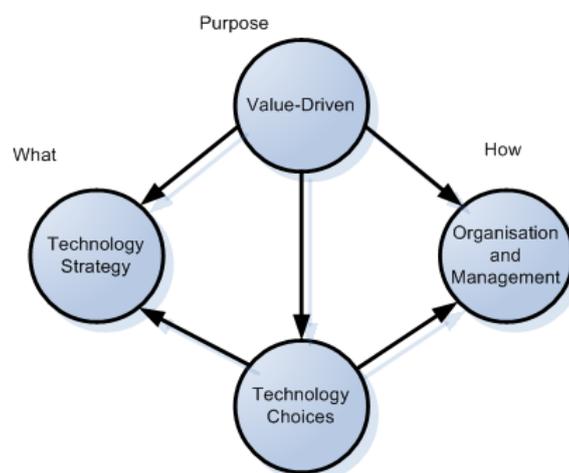


Figure 2 Management of Technology (Narayanan, 2001, p.8)

Narayanan (2001, p.8) claims that “management of technology focuses on principles of strategy and organisation involved in technology choices, guided by the purpose of creating value” for shareholders and stakeholders. This definition may be portrayed in Figure 2, which shows that the management of technology in an organisation is interlinked with choices the organisation makes in terms of technology. These decisions are value-driven, and hence technology becomes a strategic resource.

The concept of ‘technology strategy’ is a relatively recent one. Its origins can be traced back to the time when internal R&D efforts became very important for the diversification process within large diversified companies. The importance of technology in the competitive market of high-technology industries was recognised, and gradually researchers’ attention focused more and more on how to link technology and business areas. It was during the 1980s when the concept of technology strategy started to be encouraged and developed (Rosenbloom, 1993) and the idea that technology strategy can exist in industries other than those of high technology was promoted.

According to Narayanan (2001, p. 250): “Technology strategy is the revealed pattern in the technology choices of firms. The choices involve the commitment of resources for the appropriation, maintenance, deployment, and abandonment of technological capabilities. These technology choices determine the character and extent of the firm’s principal technical capabilities and the set of available product and process platforms”. Narayanan’s definition illustrates that technology strategy is concerned with the technological decisions that a company selects for acquisition, development, use or divestment.

Maidique and Patch (1978) suggested that technology strategy is a collection of interconnected decisions including technology options, level of technology competence, level of funding for technology progress, timing of technology introduction in new products or services, and organisation for technology application and development. This relates very much to the traditional view of strategic management and planning within the business.

Starting from the theory that “strategy is built on capabilities and tempered by experience”, Burgelman and Rosenbloom (1989, p. 283) have identified four environmental factors that influence technology strategy. These are: strategic behaviour, technology evolution, organisational context and industry context, as is presented in Figure 3.

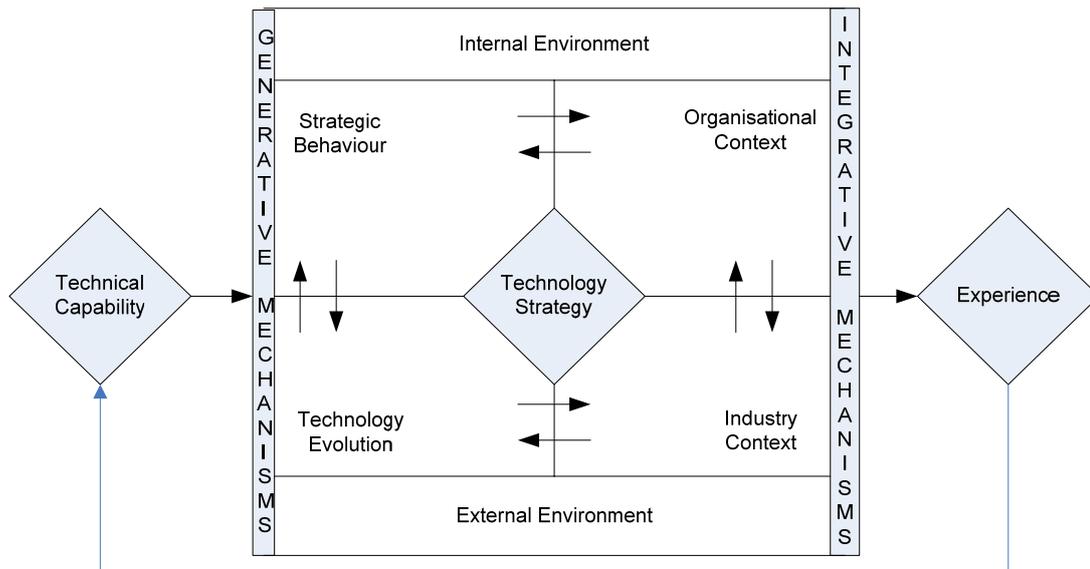


Figure 3 An evolutionary process framework for technology strategy

Strategic behaviour refers to the strategy that a company adopts in order to stimulate new product development and enhance existing technical capabilities. The formulation of a technology strategy depends on the goals that a company is trying to attain (e.g. to be a technological leader, to reduce risk, etc.).

The organisational context is essential as it influences the managers' strategic decisions in formulating technology strategy through organisational culture. Many authors have described organisational culture, but arguably the most commonly known definition is "the way that we do things around here" (Rouse and Rouse, 2000). Organisational culture encompasses all the values and beliefs that are shared by the members of an organisation and all the organisational experience accumulated over time. Therefore, a positive cultural background represents a core capability for companies involved in technology strategy development.

A major issue for companies is to select a suitable technology in order to create a successful technology strategy. The methods of acquiring technologies can be internal and external. The internal techniques refer to a company's own R&D, whereas external methods refer to collaborations that companies promote in order to develop new technologies such as joint ventures, contracted-out R&D and licensing-in (Ford and Saren, 1996).

Technology strategy also needs to be envisaged as a company-wide activity that incorporates all relevant departments: "...technology is a thread which runs through all aspects of a company and hence it can only be understood within the context of the whole company and its culture" (Ford and Saren, 1996: 44).

It can be clearly identified here that business relationships are a strategic management issue, and technology management and strategy are the building blocks for the success of organisations operating in the technology intensive industries. How does the organisation culture fit in with these elements?

Cultural Implications of Strategic Relationships

When building business relationships the culture of the organisations in question can support or hinder the integration of companies and have a major effect on the success of the joint business activity. This section of the paper will identify the role of culture and some of the key problems companies have been faced with when culture was ignored.

Few organisational forms receive undivided support from practical and theoretical specialists, in terms of profitability, attractiveness, and performance. Cross border alliances, however, seem to have gained unanimous support. These ventures are considered highly unstable (i.e., uncertain performance level) and yet are seen as an effective means of business development offering numerous advantages (e.g., shared expenses and risks, rapid access to different geographical markets, and skills (Ohmae, 1989). International joint ventures have increasingly proven to be one of the worst performers in the business environment, yet the alternatives (mergers and takeovers) are often even less attractive. For a company committed to developing its international markets, the formation of alliances has become virtually unavoidable.

Currently, learning in international joint ventures between developing and developed countries tends to be viewed as a one-way process, with Western partners assuming superiority in both technology and management, and feeling that they can learn little from local partners. Learning is often dominated by the rational drive to achieve organisational effectiveness without sufficient attention to cultural differences, which has created problems of mutual understanding (Liu and Vince, 1999).

Most of the organisational difficulties encountered by mergers and acquisitions can be linked to the hostile nature of the merger or takeover process. It is clear that a hostile take-over is likely to produce individual traumas in the acquired company, a situation that sometimes is called the "merger syndrome." This syndrome results from the uncertainty, ambiguity, tension, resistance, and anxiety created by the merger or the acquisition process, especially if large numbers of employees remain hostile after the new owner takes control. Yet a mutually collaborative, mutually friendly organisational form such as the international joint venture would not seem likely to generate a similar syndrome.

In the case of international joint ventures, with evenly distributed ownership, neither of the partners can unilaterally impose its own cultural values on the venture. Together the partners must develop what Olie

(1994, p. 385) called "a third culture composed of a combination of the two original cultures or, at least, a strongly modified version of one of the original cultures." Faced with this dynamic process of cultural interchange or blending, the international joint venture is likely to generate individual and collective conflicts that can ultimately jeopardise the venture's durability. The absence of a dominant reference culture requires that a strong cultural congruence should be promoted among the partners, although such an approach is often neglected (Zahra and Elhagrasy, 1994).

The congruence between different cultures (national and organisational) constitutes a major element in the success of an international alliance. This coincides with the observations of several theoretical studies on the theme of cultural congruence. The cultures represented in the venture will produce a more stable situation if they fit in with the organisation's structural and strategic priorities, and coexist in harmony (Nadler and Tushman, 1980; Schein, 1984; Cameron and Freeman, 1988). Nadler and Tushman (1980, p. 275) observe that, "other things being equal, the greater the total degree of congruence or fit between the various components, the more effective the organisational behaviour at multiple levels." This last statement means that the companies motivated by the foundation of an international joint venture must devote far more time to seeking out a culturally-compatible partner than is currently the case. The company may find itself faced with a dilemma: should we take the time to find the best partner (in terms of cultural congruence) or seize the opportunity to collaborate with a partner who is not necessarily compatible. Many would argue that if the reason for the joint venture is the acquisition of competence, then the cultural congruence is a second order factor and one that will always need to be managed anyway.

The cultural differences between business partners obviously imply instability and certain performance-related difficulties, but it is very difficult to understand the causes underlying this tendency. Cultural differences are often expressed in the form of conflict behaviour between the individuals working in the venture. Just as an individual's personality will influence his/her behaviour, national and organisational cultures will influence the operational performance of a company. Culture has thus often been considered as "the invisible force behind the tangibles and observable in any organisation" (Kilmann et. al., 1985). All employees, whether expatriates or local employees, will bring to the venture their basic values, beliefs, assumptions, and customs, thus shaping their attitudes and behaviour. Such personal characteristics also frame the individual's view of how a business should operate. When two or more companies start working together, their respective cultures come into contact: the local employee must deal with a different, sometimes unknown, foreign cultural environment, and likewise for the expatriate employee. The cultures represented in the international joint venture may collide and produce culture shock, disrupting the entire operation of the newly-formed company.

If culture is defined as the beliefs, values, assumptions, and customs shared by the members of a nation (national culture) and of an organisation (organisational culture), its exact contour is nearly impossible to define. Indeed, the very elements that form culture go unnoticed and remain largely invisible unless they are called into question: "because culture is defined by underlying values and assumptions, individuals have a difficult time identifying or articulating them without stimulus" (Cameron and Freeman, 1988, p. 10). Certain researchers have tried to assess this cultural distance by observing behavior patterns, collecting organisational histories or conducting in-depth interviews of the different parties involved in international joint ventures (Lane and Beamish, 1990; Baird et. al., 1990).

For culturally-incompatible partners to become compatible, a certain number of cultural reconciliation or integration measures must be implemented. This will ultimately produce a change in the respective cultures. While the beliefs, values, assumptions, and customs underlying a culture cannot be expected to change easily, cultural transformation is indeed possible. The process will occur over time as employees learn to cope with changes in the work environment and with problems raised by the process of cultural integration. This cultural transformation inside the international joint venture is a time-consuming, incremental, and evolutionary process. "Changing a company culture is more like pruning trees than remodelling machines or buildings" (Wilkins and Bristow, 1987, p. 225). Alternative approaches must be examined in view of facilitating the process of cultural integration, notably by preferential hiring of new employees (rather than transferring large numbers of expatriate or local employees from the existing operations of the respective partners). By definition, new recruits will be less rooted in a given organisational culture than local or foreign transferees, thus facilitating their integration into the culture of the newly formed company.

Achieving the cultural fit between the organisational partners is an issue identified from the literature review that needs further investigation, and hence forms a part of the research propositions for further analysis.

Due to the nature of the industry and the results of the literature review, 3 major factors contributing to the success of the organisation have been identified and included in the study: technology related factors, managerial factors and socio-cultural factors. These were structured into the questionnaire using anchored scales measuring success factors.

Research Methods

The analysis shows that there are three major streams of factors affecting building business relationships including technological, managerial and cultural issues. Due to the specificity of the paper machine clothing industry, the technological side of business operations cannot be ignored either, however this

might mean that the findings are relative to the technology intensive industries. The contribution of each of these factors towards building successful business relationships in the paper machine clothing industry is to be investigated.

Based on the background to the industry and the important trend of consolidation, an additional issue will be explored - a particular type of business relationship called integration (through for instance, joint ventures, mergers, acquisitions, alliances) within the paper machine clothing industry, using the example of Albany International.

The main research propositions being investigated in this paper are that:

- Technology contributes to the success of the business venture in the industry under investigation.
- Cultural fit is one of the key components of business relationships.
- Managerial factors play an important role in developing and sustaining business relationships.
- There are national differences in perceptions of cultural, managerial and technological effects on business relationship success (based on geographical locations of the respondents).

Regarding this study, it is impossible to precisely define an exhaustive list of the total population of the individuals / managers working within the paper machine clothing industry who are practicing the development of business relationships. For this reason sampling with randomisation and experimental control was not feasible for this research. In addition, it is known from early research experience and other studies that most managers tend to be sensitive to any inquiry about their day-to-day work and are reluctant to give their personal opinions for various reasons. The researcher contacted a number of larger companies within the paper machine clothing industry and received an agreement with Albany International to participate in this study. The company was interested in assessing its mergers / acquisitions practices. A contact person in the organisation helped to identify as many managers as possible working with other companies as customers, suppliers, acquisitions, etc. Therefore, it was an attempt at a *Census sample*. The sample used for this research could be classed as a 'purposive and convenience sample'.

To overcome the problem of a respondent not being aware of business relationships and practices within their organisation, the assumption was made that the managers at different levels of the organisation at least know about and are also likely to practise development of business relationships at different levels. The idea behind the research is to provide a picture of business relationships success in general and the use of knowledge of these practicing managers providing the opportunity to gain knowledge about this phenomenon across a range of functions and responsibilities.

Focusing on one company allowed the limited time and resources to be used in the most effective and efficient manner, with the assumption that the participants would have a definite interest in developing successful business relationships and that their contact details would be relatively simple to access due to agreement with the company. It was assumed that the participants would be more willing to take part in the research because of their apparent interest in the topic too.

Measuring the Business Relationships Success

In order to make it easier to model business relationships' success it is necessary to identify the factors influencing this success. As there is no clear, reliable, widely accepted method for determining the success of a business venture, a portfolio management concept was used to identify the success of the business relationships as success of individual factors / projects influencing it. This is a serious problem because good project / venture selection criteria, especially ones that permit measuring and comparing the uncertainties of individual projects, are essential to ensuring the quality of projects assembled into the final portfolio / venture. Consequently, with the judgment of R&D managers alone no longer acceptable, it is important to develop a method that would ensure that different people assessing the same projects arrive at answers that can be compared.

This method / model is based on "anchored scales." These are ordinal measures utilising numeric indicators, each of which is associated with a set of words or phrases that help the respondent to "anchor" his or her evaluation. In this fashion, it becomes much easier for multiple respondents to use the same standard when evaluating a project / venture, comparing projects at different stages of development or from different businesses, and performing evaluations at different times. In sum, anchored scales provide a simple, robust basis for obtaining multiple inputs more reliably and easily. Anchored scales also force a structuring of whatever issue they are being used to assess. Issues are otherwise treated as highly qualitative and complex matters that are not very easily shared. Anchored scales provide an opportunity to open such issues to multiple inputs more easily and reduce the risk of narrowly based judgments.

When developing anchored scales for the purposed of this research the participants were asked to contribute two or more behavioural anchors for each point of the scale representing dimensions. (Jones, Steffy and Bray, 1991, p.318) A group of participants was then chosen to discuss and finalise the descriptors of the dimensions for each of the anchors in the areas of technology, culture and management.

Likert scales were also considered, but dismissed by the researcher during the pilot stage in order to overcome the possibility of the respondent picking the middle answer.

Developing the Scales

Building on the initial literature review on strategic business relationships and their implementation in organisations, the proposed model seeks to develop a set of standard scales that any company could use as a point of departure for customising to its unique circumstances. The factors identified the most common critical technological, managerial and cultural elements of uncertainty that would be applicable to most companies and to the typical stages in most industrial situations (see Tables 1, 2 and 3). Over two years, these elements were narrowed and polished, and then elaborated with a set of unique "anchoring phrases" to establish an anchored scale for each. These were planned to be tested within Albany International (Swedish branch) for practicality and balance. The final set of scales developed provides a method that:

Can be used by multifunctional teams to achieve consensus and allow communication.

- Requires relatively little effort to operate.
- Is applicable at any stage / department of the venture.
- Recognises key innovation drivers, e.g., time to market, regulatory, etc.
- Is applicable to most types of organisations.
- Achieves a result relevant to determination of the success criteria.
- Is quickly adaptable for use by anyone.

An example of one of the scale descriptors is presented below:

Proprietary Position—reflects the probability of developing a strong, defensible patent or proprietary position in the technology to be researched

5 A high probability that technical work will lead to strong defensible patents (or clearly identified trade secrets) that should create an exclusive position and synergy with existing patents and/or trade secrets.

4 Good protection is probable; could lead to a dominant position with limited threat of interference. May be hard to defend claims in some places.

3 Chance of good coverage, possibility that prior work may weaken claim coverage; should lead to competitive differentiation but may be difficult in the long-term.

2 Poor chance of patent coverage, some claims may possibly provide some deterrent to competition and short-term advantage.

1 No obvious proprietary position available, technology easy to copy.

Alternative Methods

Many methods of project portfolio selection have recognised the uncertainty issue but treated it either as a simplistic element or one that is incorporated in overly sophisticated mathematical models (Cooper, *et al.*, 1997). Neither of these approaches has ensured reliable multifunctional inputs, or satisfied all of the

aims stated above. Three methods used previously do come close. The closest, when operated in team fashion, is a checklist method in which common project attributes are listed and scored, for example 1-5 from best to worst. At its best, this method would appear to satisfy all of the aims. In practice, however, participants rarely agree because they have very different views of what constitutes a 1, 3 or 5 ranking, resulting in arguments rather than consensus.

The multi-criteria method of Mottley and Newton (1959) employs five criteria: promise of success, time to completion, cost of project, strategic need, and market gain. A question is asked related to each criterion and three answers are given, each scored 1, 2 or 3. Uncertainty is handled as "Promise of Success" and the question is, "What is the best estimate of the promise of technical success consistent with known economics and the state of the art?" The range of answers is "Unforeseeable 1," "Fair 2" and "High 3." Many other methods for project selection are available and have been reviewed but are not discussed further here. The researcher has built on the above and presents in Tables 1, 2 and 3 a set of anchored scales that, when applied appropriately by a group, should lead to consensus on the relative success of business relationships.

Application of the Anchored Scales

The researcher recognises that not all the scales are important to all businesses and would recommend that users first determine which scales are useful to them in assessing the probabilities of technological, managerial and cultural fit success of their business relationships. It is believed that most companies find only some of the scales appropriate to their type of business and to the nature of their activities.

It is also important to note that the value of the weighting factor, and sometimes the choice of scales, will change, depending on the stage of the project under consideration. The weighting used when screening potential projects in the concept stage might be quite different from that for more mature projects.

Each scale within Technological, Cultural Fit or Managerial Success Factors should be assigned an equal weighting, so that the total weighting for all 3 types of success factors adds up to 1, or 100 percent (see Tables 1, 2 and 3). If a particular consideration for any project is not important, it can be assigned a weight of zero. The product of the weight and the anchored scale score is then entered in the Weighted Success Factor column. The process should be repeated until the table is complete. After the table is complete for Technological Success Factors, the same procedure should be followed for the Cultural Fit and Managerial Success Factors. The final Success Factor is then obtained by multiplying the Technological, Managerial and Cultural fit Success Factors together. The final probabilities of success, developed with Table 1, Table 2 and Table 3, can be used in the analyses of strategic business relationships using the success factors that are appropriate to the business.

Table 1 Anchored Scales for Technological Success Factors

Success Factor	Weight	Comments	Anchored Scale					Weighted Success Factor
			1	2	3	4	5	
Proprietary Position								
Competencies/ Complexity of Skills								
Process Complexity								
Access to External Technology								
Manufacturing capability								
TOTAL 1 (or 100%)								

Table 2 Anchored Scales for Managerial Success Factors

Success Factor	Weight	Comments	Anchored Scale					Weighted Success Factor
			1	2	3	4	5	
Customer / Market Need								
Market / Brand Recognition								
Distribution Channels								
Customer Strength								
Raw Materials Supply								
Environment, Health and Safety								
TOTAL 1 (or 100%)								

Table 3 Anchored Scales for Successful Cultural Fit

Success Factor	Weight	Comments	Anchored Scale					Weighted Success Factor
			1	2	3	4	5	
Start-up Formation								
New Managerial Structure and Processes								
Time								
Motivation and Training								
Change / Conflicts								
Work Orientation								
TOTAL 1 (or 100%)								

It is believed that the use of these anchored scales in the right environment can produce not just quantification of the success factors of specific business venture, but will also help in early identification of the critical issues that have to be managed on the way to integration / completion.

Data collection and Analysis

The survey questionnaire aimed at establishing a series of benchmarks on the management of technology, culture and organisation within the paper machine clothing industry and the personal points-of-view of the senior R&D / technology officers of the technology-intensive corporation - Albany International – a world leader in paper machine clothing industry. The approach was as follows:

Firstly, a list of companies involved in R&D within Albany International was identified for inclusion in the sample. The geographical scope of the survey includes branches from the following countries: the U.S., Western and Eastern European countries: UK, Sweden, Finland, Netherlands, France, Russia and Japan. Although the majority of the participants do not necessarily originate from the country they work in, the assignment of a corporation's nationality was based on the location of the company. The sample comprised 10 companies. This list of organisations was compiled from the main Albany International Website sources and includes the main research centres, manufacturing facilities as well as the sales offices of Albany International worldwide. The people approached had all at least one experience of integrating into the culture of Albany International and of dealing with technology knowledge transfer. The company at the time of the survey had total 3590 employees, 320 of whom were in a managerial position. Out of these, about 120 were identified as individuals who could reflect on their involvement in integration with Albany International either through a joint venture agreement, or through an acquisition.

Secondly, the core themes within the survey questionnaire were developed based on the issues identified in the literature review related to key components contributing to the probability of successful relationship between two organisations. The anchor scale descriptors were compiled based on the consultations with the survey participants. This questionnaire was piloted with 5 Albany International managers in different locations, who suggested some amendments to the terminology and recommended the inclusion of additional documentation with the actual questionnaire to explain specific terms under investigation.

Questions regarding technology, management and culture were asked at both the corporate level and the largest or most representative business unit level of the organisation. Since the questionnaires were sent to the people responsible for R&D technology at the corporate level, the answers naturally have a bias to the corporate view. An English-language questionnaire was mailed to all the participants, as it had been agreed with the contact person within the company under investigation, who confirmed that all employees at higher than middle management level within Albany International used English in their working environment. Since the pilot picked up on the terminology, this should not have affected the outcome of the survey significantly.

Thirdly, the companies were encouraged several times by mail or phone to complete and return the questionnaire, so that the data was collected from a fairly representative number of branches. The analyses reported here are based on data provided by 10 out of 16 branches of Albany International. The questionnaires were sent in 2 batches. The first batch returned 43% of responses. The second batch brought an additional 27.5% responses. This process took about 6 months. However, 12.5% of the responses were incomplete, or were sent empty, hence were discarded. This provided a response rate of 58%. In the coding of the questionnaires, all company-related information was omitted, so that the resulting database was a collection of anonymous information.

All the returned questionnaires were split into parts with information on the respondents and their responses to questions set within the survey. Two separate databases were compiled on the basis of this data: one as a codebook with private participants' information, and second with their answers to the questions.

There are different possible partners with whom a company can cooperate in technological innovation activities. One – other divisions of the company – was cited by the firms as the most frequently sought partner for (internal) co-operation. Regarding external organisations, the most frequent partners are customers, suppliers, and universities, followed by government laboratories, early-stage, technology-based companies, and competitors. Since this question explicitly asked for the frequency of the collaboration, a less-frequent cooperation does not necessarily imply that the partner is less important. The regional differences between the firms are small, with the exception that the North American and Swedish companies more frequently cooperate with young, technology-based firms.

Modelling Success of the Integration Strategy Indexes

The original author's index tools described in the research methodology have been used in the present study to describe the data by geographical location and overall for the whole sample. The results are summarised in the tables and graphs below.

The anchored scale ranging from 1 till 5 was used to assess the success for each factor contributing to technology commerce and culture. These have been weighted equally and the weighted success index was calculated. The success index shows the success factors ranging from 1 - being very low and 5 - representing very high score identifying the level of importance of the variable to the participant. Table 4, 5 and 6 illustrate the calculations of weighted average success index based on the results of the survey. The overall survey picture shows the importance of each element in the development of successful relationships with another organisation for Albany international. The geographical preferences to these key success factors are illustrated at the end of this section.

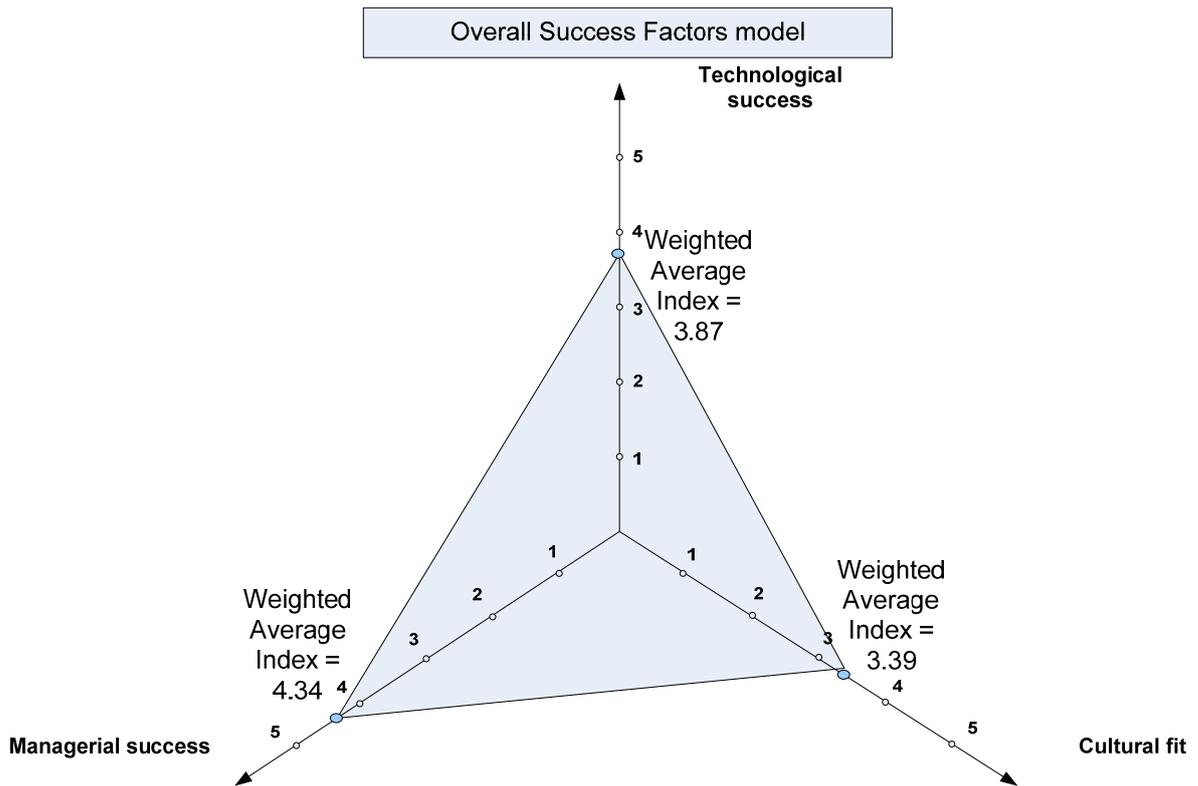


Figure 4 Overall Success Factor

The illustration of the results can be seen in Figure 4 showing the overall Success Factor model. This clearly demonstrates that the strongest component of this model for Albany International is managerial success with the weighted average success index of 4.34. The next element important to Albany International is cultural fit with an index of 3.39, and finally the technological success index is 3.87, which has a moderate significance.

In order to calculate the Technological, Managerial Success and Cultural Fit Factors the formula from Equation 1 was used. This formula was used for calculations of each component Weighted Success Factor in Tables 4, 5 and 6:

$$WSF = \frac{\sum_{i=1}^5 AS_i \times N_i}{\sum_{i=1}^5 N_i} \times WI \quad \text{(Equation 1)}$$

Where :

WSF- Weighted Average Index for Technological Success, Managerial Success, and Cultural Fit

AS_i– Anchor Scale (ranging from 1 to 5)

N_i– Number of times the participants have chosen the category from 1 till 5 in %

WI – Weighting Index (out of 1)

Technological Success Factor

The Overall Weighted Success Index equals **3.873** for Technological Success Factor, showing a moderate figure, identifying the areas where the company is really good at: “technological innovation”, “competencies / skills complexity” and “manufacturing capability”. The company has not rated itself highly in following factors: “complexity”, “access to external technology” and “proprietary position”. This confirms the nature of the industry being technology intensive, and claims of Albany International being a technological leader.

Table 4 Anchored Scales for Technological Success Factor

Success Factor	Weight	Anchored Scale					Weighted Success Factor
		1	2	3	4	5	
Proprietary Position	0.166667	3.8%	11.5%	23.1%	38.5%	23.1%	0.609
Competencies / Skills Complexity	0.166667	0%	0%	15.4%	42.3%	42.3%	0.712
Complexity	0.166667	0%	11.5%	34.6%	46.2%	7.7%	0.58(3)
Access to External Technology	0.166667	7.7%	19.2%	34.6%	23.1%	15.4%	0.532
Manufacturing capability	0.166667	0%	0%	15.4%	38.5%	46.1%	0.718
Technical Innovation	0.166667	0%	3.9%	3.8%	46.1%	46.2%	0.724
TOTAL 1 (or 100%)	1						3.873

An example of the calculation of the Weighted Success Factor for Proprietary Position is presented below:

$$\begin{aligned}
 WSF_{\text{proprietaryposition}} &= \frac{AS_1 \times N_1 + AS_2 \times N_2 + AS_3 \times N_3 + AS_4 \times N_4 + AS_5 \times N_5}{N_1 + N_2 + N_3 + N_4 + N_5} \times WI = \\
 &= \frac{1 \times 3.8\% + 2 \times 11.5\% + 3 \times 23.1\% + 4 \times 38.5\% + 5 \times 23.1\%}{3.8\% + 11.5\% + 23.1\% + 38.5\% + 23.1\%} \times 0.16667 = 0.609
 \end{aligned}$$

Managerial Success Factor

Table 5 below presents The Overall Weighted Success Index = **4.34** for Managerial Success Factor, showing a fairly high average figure, identifying the areas where the company is really good at: “market / brand recognition”, “distribution channels”, “raw materials supply”, “environment, health and safety” and “response to customers/ market needs”. The company has also rated itself highly in “customer strength”. This confirms the nature of the industry being profit orientated and customer focused as well as Albany International strive to deliver value to customers, employees and shareholders.

Table 5 Anchored Scales for Managerial Success Factor

Success Factor	Weight	Anchored Scale					Weighted Success Factor
		1	2	3	4	5	
Customer/Market Need	0.166667	0%	0%	19.2%	42.3%	38.5%	0.699
Market/Brand Recognition	0.166667	0%	0%	7.7%	34.6%	57.7%	0.750
Distribution Channels	0.166667	0%	0%	15.4%	23.1%	61.5%	0.744
Customer Strength	0.166667	0%	0%	15.4%	69.2%	15.4%	0.66(6)
Raw Materials Supply	0.166667	3.8%	0%	3.8%	50%	42.2%	0.712
Environment, Health and Safety	0.166667	0%	0%	0%	38.5%	61.5%	0.769
TOTAL 1 (or 100%)	1						4.34

Cultural fit

Table 6 below presents The Overall Weighted Success Index = **3.398** for Success in achieving a Cultural Fit, showing a moderate average figure, identifying the areas where the company is really good at: “new managerial structure and processes”, “motivation and training for employees” and “work orientation”. The company did not rate itself highly in “start-up formation”, “change and conflict resolution” and “time” factors. The results were most controversial for this factor and depending on the position held by respondents and the impact the integration process had on the respondents the answers varied. A few trends can be picked up and these will be summarised at the end of this section. The results of the Cultural Fit section confirm the proposition that Albany International should be managing the cultural fit process.

Table 6 Anchored Scales for Successful Cultural Fit

Success Factor	Weight	Anchored Scale					Weighted Success Factor
		1	2	3	4	5	
Start-up Formation	0.166667	7.7%	19.3%	30.7%	42.3%	0%	0.513
New Managerial Structure and Processes	0.166667	7.7%	3.8%	26.9%	38.5%	23.1%	0.609
Time	0.166667	7.7%	26.9%	50%	15.4%	0%	0.455
Motivation and Training	0.166667	3.8%	3.8%	26.9%	53.9%	11.6%	0.609
Change / Conflicts	0.166667	3.8%	3.8%	34.6%	57.8%	0%	0.577
Work Orientation	0.166667	3.8%	7.7%	7.7%	65.4%	15.4%	0.635
TOTAL 1 (or 100%)	1						3.398

In summary, whereas it was clear that technological success is the strongest point of the organisation, and there are some incremental problems with managerial success of the integration within AI, based on the factors described in the cultural fit section, it was clear that culture plays a significant role in determining the integration success.

Indices by Geographical Regions

The indices calculated by geographical location are presented in Table 7 and Figure 5.

Table 7 Summary Index by Geographical Region

	Technological success index	Managerial success index	Index of cultural fit
Japan	4.160	4.830	4.330
Germany	4.160	4.000	2.000
UK	3.330	4.160	3.160
Finland	4.000	4.580	4.000
France	4.000	4.500	3.750
USA	3.660	4.500	3.220
Netherlands	3.750	4.200	3.290
Sweden	3.950	4.220	3.370
Overall for AI	3.873	4.340	3.398

The indices indicate a strong technological base in the majority of the locations except for the UK where the index is 3.33 out of 5. In terms of the managerial success index it was rated very strongly with all the results above 4. Japan, Finland and USA were the strongest respondents here due to their focus on managerial practices and procedures to implement change within the organisation. Finally the index for cultural fit was significantly lower than the other two indices, scoring very low with 2 out of 5 for Germany. This can be due to the major merger which had taken place in 1999 between Albany International and Geschmay, with respondents still going through the motion of the integration process. Based on the nature of the business unit and traditional approaches that have been used within the organisation the focus of the success index shifts from technological success, to managerial, and in some places to achieving the cultural fit. The 3 dimensional models for each location show the difference in preferences for each of these factors are presented in Figure 5 below.

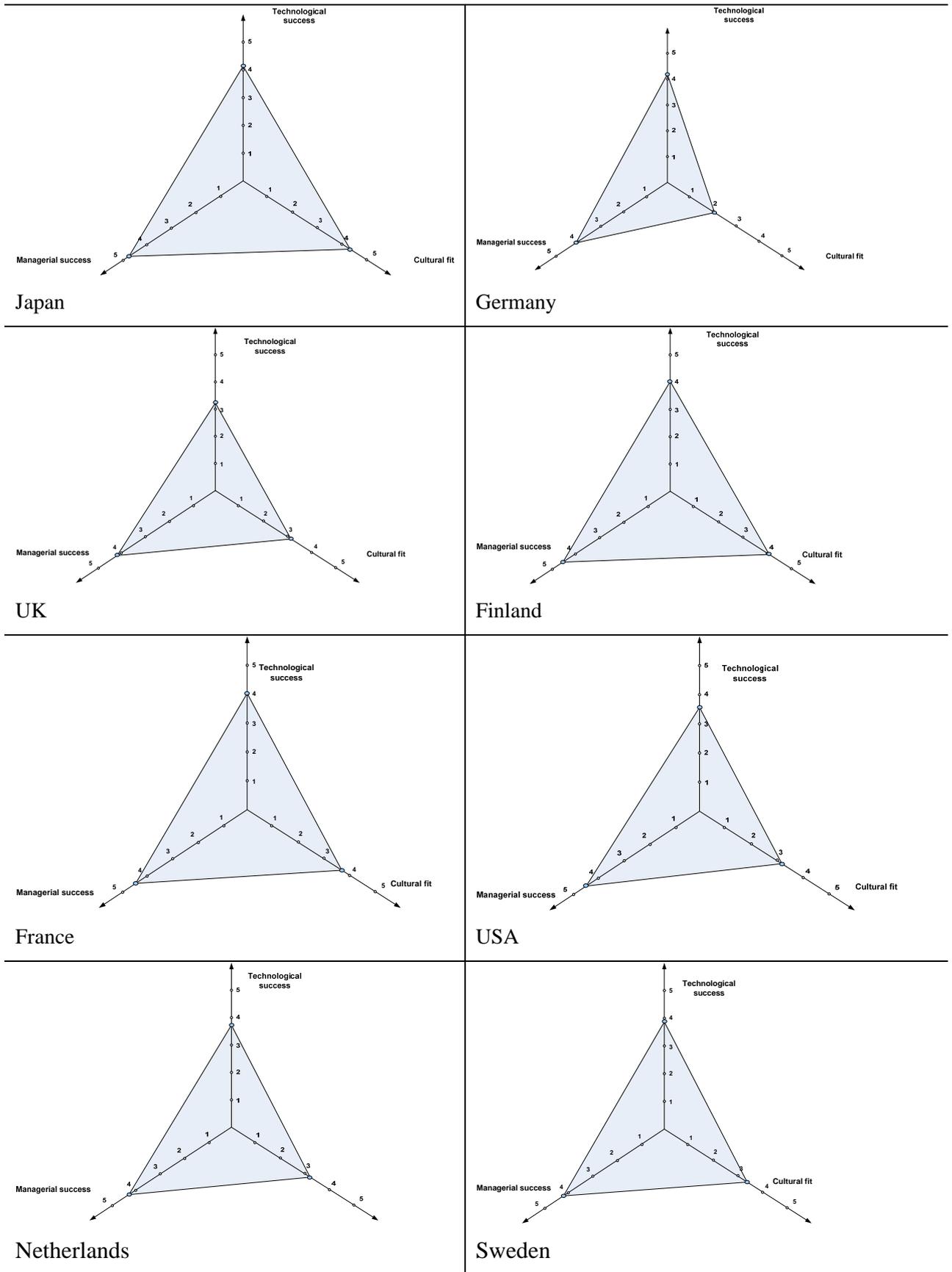


Figure 5 Model by country

In summary, respondents from the Japanese branch of AI have rated managerial success as the most important part of the success of the integration strategy with a strong index of 4.83 out of 5. Respondents from the German branch identified cultural fit as one of the critical components in achieving successful integration. Respondents from the UK, Finland, France, Netherlands, USA and Sweden consistently rated managerial success higher than technological success or cultural fit. It is important to note that achieving a cultural fit has been given the least priority by these respondents too. One of the limitations of this study is that it was not possible to obtain responses from unequal numbers of respondents representing different branches and the country.

Correlation of the Data

To enhance our understanding of the key issue of relationship between the factors under investigation the Pearson's correlation coefficient was used. The correlation coefficient, like the covariance, is a measure of the extent to which two measurement variables "vary together." Unlike the covariance, the correlation coefficient is scaled so that its value is independent of the units in which the two measurement variables are expressed. The value of any correlation coefficient must be between -1 and +1 inclusive.

The correlation analysis tool can be used to examine each pair of measurement variables to determine whether the two measurement variables tend to move together - that is, whether large values of one variable tend to be associated with large values of the other (positive correlation), whether small values of one variable tend to be associated with large values of the other (negative correlation), or whether values of both variables tend to be unrelated (correlation near zero).

This correlation analysis tool is particularly useful when there are more than two measurement variables for each of N subjects. It provides an output table, a correlation matrix, showing the value of correlation coefficient applied to each possible pair of measurement variables.

The data collected through questionnaire survey has been put through Microsoft Excel and Stata quantitative software to identify the relationships between all 18 variables. The results of correlation analysis are presented in Table 8 showing a value of correlation coefficient and its degree of association against each pair.

The most significant relationships have been identified between :

- "Technical complexity" and "Use of external technology" with a correlation coefficient of 0.6118 and significance of 0.009;

- “Channels to market” and “Competencies” with a correlation coefficient of 0.5641 and significance of 0.0027;
- “Start-up formation” and “customer / market needs” with a correlation coefficient of 0.6895 and significance of 0.0001;
- “motivation and training” and “Time” with a correlation coefficient of 0.6275 and significance of 0.0006;
- and “managerial approaches” and “change” with a correlation coefficient of 0.7057 and significance of 0.0001.

The majority of the negative correlations have been related to two components: market / brand recognition and customer strength. However, as it can be seen from the 14, although the majority of the correlations are negative between these two variables and the rest, there are no significant correlations found for these particular variables.

Table 8 Correlation Coefficients and Degree of Association between Variables

	propriet	competen	complex	externa	capabil	innova	needs	brand	channels	strength	supply	safety	startup	manage	time	motivat	change	orient
Propriet	1																	
competen	0.2234	1																
sign levels (t-stat)	0.2726																	
Complex	0.2927	0.3739	1															
sign levels (t-stat)	0.1467	0.0599																
Externa	0.211	0.1256	0.6118	1														
sign levels (t-stat)	0.3007	0.5409	0.0009															
Capabil	-0.1109	0.3637	0.2676	0.2078	1													
sign levels (t-stat)	0.5896	0.0678	0.1862	0.3083														
Innova	0.2511	0.191	0.0991	0.1504	0.3086	1												
sign levels (t-stat)	0.2159	0.3501	0.63	0.4634	0.1251													
Needs	-0.0131	0.2693	0.2957	0.1847	0.0335	-0.124	1											
sign levels (t-stat)	0.9492	0.1834	0.1425	0.3663	0.871	0.5463												
Brand	0.3669	-0.1278	-0.114	0.0793	0	0.2899	-0.2883	1										
sign levels (t-stat)	0.0652	0.5338	0.5794	0.7	1	0.1509	0.1532											
Channels	-0.185	0.5641	0.1942	-0.104	0.1649	-0.3637	0.4697	-0.3246	1									
sign levels (t-stat)	0.3656	0.0027	0.3418	0.6131	0.4207	0.0678	0.0155	0.1057										
Strength	0	-0.1953	0.1741	0.1212	-0.1922	-0.1898	-0.0944	0.2182	0.093	1								
sign levels (t-stat)	1	0.3391	0.3951	0.5553	0.3469	0.3531	0.6466	0.2842	0.6515									
Supply	-0.3589	-0.0559	0.1408	0.2609	0.1769	-0.026	0.162	-0.3176	0.0463	-0.0809	1							
sign levels (t-stat)	0.0718	0.7863	0.4928	0.1981	0.3873	0.8998	0.4291	0.1138	0.8224	0.6945								
Safety	-0.2553	-0.0342	0	-0.0744	0.5562	-0.1664	-0.0083	-0.2488	0.1712	0	0.156	1						
sign levels (t-stat)	0.2082	0.8681	1	0.7179	0.0032	0.4164	0.968	0.2203	0.4029	1	0.4466							
Startup	0.0634	0.3654	0.4537	0.4077	0.244	-0.093	0.6895	-0.1896	0.3272	-0.1448	0.3963	0.1461	1					
sign levels (t-stat)	0.7583	0.0664	0.0199	0.0387	0.2296	0.6513	0.0001	0.3536	0.1027	0.4803	0.045	0.4765						
Manage	0.385	0.6075	0.5014	0.174	0.1814	0.1005	0.6017	-0.2459	0.5194	-0.1878	-0.0639	-0.1043	0.5328	1				
sign levels (t-stat)	0.0521	0.001	0.0091	0.3954	0.3751	0.6251	0.0011	0.2259	0.0065	0.3581	0.7566	0.612	0.0051					
Time	0.2466	0.2593	0.2678	0.0558	0.0101	0.0274	0.3449	-0.1865	0.2054	0.1709	0.1042	-0.0675	0.3731	0.5812	1			
sign levels (t-stat)	0.2246	0.2009	0.186	0.7867	0.9609	0.8941	0.0844	0.3617	0.3142	0.4038	0.6125	0.7433	0.0604	0.0018				
Motivat	0.2004	0.2739	0.3588	0.1434	0.0469	0.1273	0.5226	-0.2422	0.186	-0.0793	0.3295	0.1391	0.7206	0.5514	0.6275	1		
sign levels (t-stat)	0.3264	0.1758	0.0718	0.4846	0.8201	0.5354	0.0062	0.2332	0.363	0.7002	0.1003	0.498	0	0.0035	0.0006			
Change	0.2479	0.3463	0.4532	0.2566	0.1649	0.1303	0.6101	-0.1623	0.2394	-0.2789	0.2868	-0.0408	0.758	0.7057	0.5867	0.7757	1	
sign levels (t-stat)	0.222	0.0831	0.0201	0.2058	0.4207	0.5258	0.0009	0.4283	0.2389	0.1676	0.1554	0.8432	0	0.0001	0.0016	0		
Orient	0.1274	0.4321	0.236	0.2177	0.2627	-0.0726	0.1115	-0.2301	0.2413	-0.3766	0.1143	0.0066	0.2349	0.4628	0.3426	0.1084	0.3533	1
sign levels (t-stat)	0.5352	0.0275	0.2458	0.2855	0.1947	0.7247	0.5876	0.2582	0.235	0.0579	0.5782	0.9745	0.2481	0.0173	0.0867	0.5981	0.0766	

Regressions Analysis

Although the correlation of the variables has given some interesting results, to test the remaining research propositions it was decided to run through regression analysis to investigate the dependency of the variables on each other. The Regression analysis tool performs linear regression analysis by using the "least squares" method to fit a line through a set of observations. It was possible to analyze how a single dependent variable is affected by the values of one or more independent variables. Based on the correlation analysis a number of variables important to this study have been identified and patterns have been tested using regression. Multiple regressions are a statistical tool for understanding relationships between more than two variables. Multiple regressions involve a variable to be explained (called dependent variable) and additional explanatory variables that are thought to be associated with changes in the dependent variable (Garson, 2001).

The three main tested components: technology, culture and management have been incorporated into the regression analysis. For the purpose of this study four dependent variables: "technological / technical innovation", "start-up formation", "work orientation" and "market /brand reputation" are tested against the remaining 14 independent variables.

The regression model was estimated for each dependent variable in an equation of the form:

$$Y = a + b_1 X_1 + b_2 X_2 + \dots + b_i X_i$$

Where Y = Dependent variable ("technological / technical innovation",
"start-up formation",
"work orientation" and
"market /brand reputation")

a = Constant or intercept

b_i = Regression coefficient for the corresponding X

X_i = Independent variables

For regression analysis to be valid, it should meet several requirements. First, the sample size should be adequately relative to the numbers of variables that are included in the study. Sadly, there is no solid rule about this (Hays, 1994). Several authors recommend the minimum ratio of 3 to 5 observations for each independent variable in the variate (e.g., Hair *et. al.*, 1995; Speed, 1994). With 14 independent variables to be estimated in this research, the size of 70 valid responses was considered adequate according to the minimum ratio and statistic power for regression estimates (Cohen and Cohen, 1983).

Secondly, the basic assumptions of regression analysis include linearity between dependent and independent variables and independence, constant variance and normality of the error. For the present

analysis, scatter plots of the individual variables indicated general linear relationships between the dependent variable and the independent variables. The test of homoscedasticity was left after the model estimation since the variables are metric variables, which are best examined through the analysis of the residuals (Hair *et. al.*, 1995). Other evaluations of model adequacy were carried as part of the model estimation.

With Stata variable selection procedure, stepwise selection was used to determine which of the fourteen independent variables to include in the final regression. Stepwise multiple regressions are a way of computing regression in stages. In stage one, the independent variable best correlated with the dependent is included in the equation. In the second stage, the remaining independent with the highest partial correlation with the dependent, controlling for the first independent, is entered. This process is repeated, at each stage partialling for previously-entered independents, until the addition of a remaining independent does not increase R^2 by a significant amount (Garson, 2001). The final model was chosen based on the criteria of assessing the overall relationships of the variables and the basic assumption.

A basic assumption in examining sufficiency of the regression model is to study whether the model can be substantively enhanced within the conditions set by the available data (Cohen and Cohen, 1983). The estimated residuals associated with the equation were assessed for systematic behaviour. Examination of the residual plots indicated no violations of the assumptions for the final regression model.

A key issue in interpreting the regression variate is the correlation among the independent variables. This is a data problem, not a problem of model specification. But it has substantial effects on the result of the regression procedure. First, it limits the value of the coefficient of determination and makes it increasingly more difficult to add unique explanatory prediction from additional variables. Second, and just as important, it makes determining the contribution of each independent variable difficult because the effects of the independent variables are “mixed” or confounded, owing to collinearity (Hair, *et. al.*, 1995). In the present analysis, multicollinearity has not caused any concern based on a certain degree of correlation between the independent variables. The regression estimates are reported in Tables 9, 10 and 11.

In addition to the regression coefficients contributing to the equations other statistics indicated the goodness of fit of the model is also presented in Tables 9, 10 and 11. The adjusted coefficient of determination (adjusted R^2) is a modified measure of the coefficient of determination (R^2); it takes into account the number of predictor variables included in the regression equation. The F test is used to test the significance of R , which is the same as testing the significance of R^2 ; this is equivalent to testing the significance of the regression model as whole. If $F(p) < 0.05$, then the model is considered significantly better than would be expected by chance. In the present analysis, the F statistic, and its observed

significant value (p) provide information for testing the hypothesis that the population R^2 is 0. On inspection of these statistics, they indicated acceptable goodness of fit of the final regression model.

Tables 9 shows results of the regressions in terms of dependencies identified for technology, culture and commerce related data. The regression results with equations and graphical representation are presented below.

Technological Innovation

The results of the regression for technological innovation as a dependent variable are presented in Table 9.

Table 9 Technological Innovation

<i>Dependent variable:</i> Technological Innovation innova = 4.556 + 0.384*capabil – 0.417*channels		
Independent Variables		
Longitudinal effect	Manufacturing capability	0.384* (2.100)
	Channels to market	-0.417* (-2.363)
Const		4.556** (4.440)
Number of observations		70
F-stat (2, 23) = 4.30		R-squared = 0.2719 Adj R-squared = 0.2086
** - 1%, * - 5% significance level		

One of the research propositions set out in the research methodology part is concerned with a set of factors that have an impact on the technological innovation within Albany International at different geographical locations. As Table 9 shows, the final regression equation testing this proposition was obtained with two independent variables “manufacturing capability” and “channels to market” included into the equation. These variables explained only 20.86% of the variance in “Technological innovation” (Adjusted R-squared = 0.2086) hence making the equation inadequate. It is important to note that all the variables that were excluded from the final regression equation had no significant impact on “technological innovation” within organisation either. However, the interpretation of the equation could state that “manufacturing capability” has some positive impact on the “Technological innovation”, and the variable “channels to market” has some negative impact on “Technological innovation.

Both of these Influences on “Technological innovation” are presented in Figure 6 and 7 below. Unfortunately with two or more regressors it is impossible to produce one graph. Stata is though able to

produce two graphs representing one equation. In the added variable plots below is an attempt to project multidimensional data back to the two-dimensional world for each of the original regressors. (Stata, 2003) In construction of the relationship between Y and X the added variable plot is forced to be linear

These two graphs are illustrating the dependency of the technological innovation on channels to market and manufacturing capability variables.

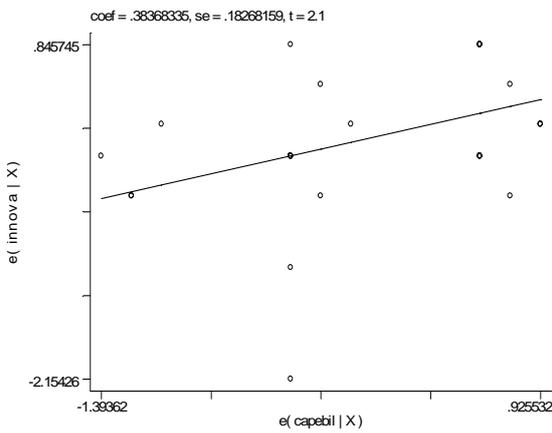


Figure 6 Technological innovation vs. Manufacturing Capability

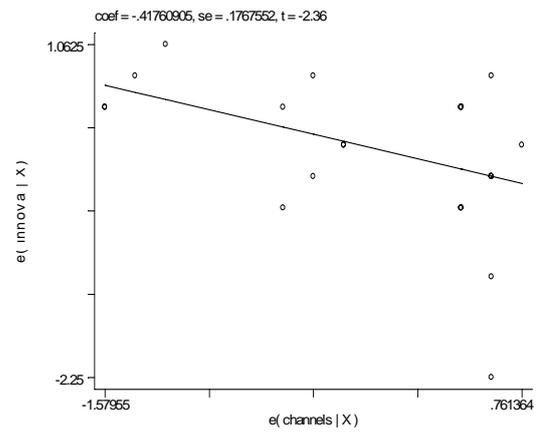


Figure 7 Technological Innovation vs. Channels to Market

Start-up formation

The results of the regression for start-up formation as a dependent variable are presented in Table 10.

Another research question under investigation is concerned with a set of factors that have an impact on the formation of the new organisation with Albany International. As Table 10 shows, the final regression equation testing this proposition was significant for three independent variables “Use of external technology”, “Customer / Market needs” and “Motivation and Training of Employees” with the F-statistic of 19.11 ($p < 0$). These variables explained 68.49% of the variance in “start-up formation” (Adjusted R-squared = 0.6849). It is important to note that all the variables that were excluded from the final regression equation had no significant impact on “start-up formation” within organisation. The Interpretation of the equation is that all of these three independent variables have a positive impact on the “start-up formation”, although the “Use of external technology” variable has a smaller influence (0.224) on the “start-up formation” than the “Customer / Market needs” (0.508) and “Motivation and Training” (0.524), as their significance was less than 1%.

Influences of these three variables on “Start-up Formation” are presented in Figure 8, Figure 9, and Figure 10 below.

Table 10 Start-up Formation

<i>Dependent variable:</i> Start-up formation		
Startup = -1.683 + 0.224 * Externa + 0.508 * needs + 0.524 * motivate		
Independent Variables		
Longitudinal effect	Use of external technology	0.224* (2.334)
	Customer / Market needs	0.508** (2.937)
	Motivation and Training	0.524** (3.628)
Const		-1.683 (-2.526)
Number of observations		70
F-stat (3, 22) = 19.11		R-squared = 0.7227 Adj R-squared = 0.6849
** - 1%, * - 5% significance level		

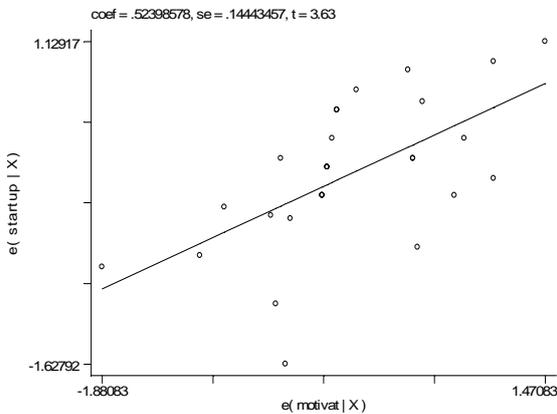


Figure 8 Motivation and Training Vs. Start-up Formation

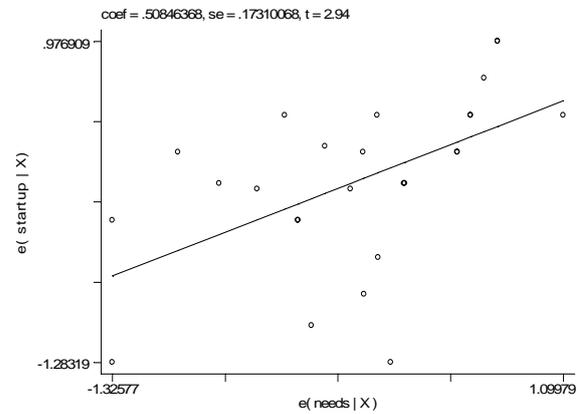


Figure 9 Customer / Market needs Vs. Start-up Formation

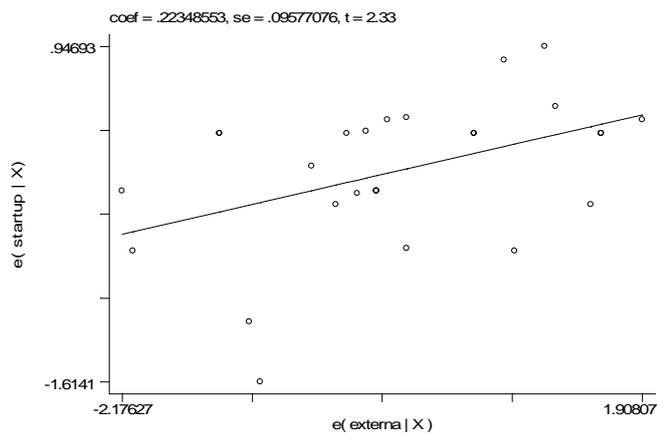


Figure 10 Use of external technology Vs. Start-up Formation

These three graphs illustrate the dependency of the “Start-up formation” on “Motivation and Training”, “Customer / Market needs”, “Use of external technology” variables. It is important to note that this dependence was support by 68.49% of the data hence is a very strong linear positive regression.

Work orientation

The results of the regression for work orientation as a dependent variable are presented in Table 11.

Table 11 Work Orientation

<i>Dependent variable:</i> Work orientation		
Orient = 5.48 – 0.74 * Strength + 0.48 * time		
Independent Variables		
Longitudinal effect	Customer strength	-0.7439236 (-2.554)
	Time	0.4756944* (2.389)
Const		5.484375 (4.536)**
Number of observations		70
F-stat (2, 23) = 5.22		R-squared = 0.3124 Adj R-squared = 0.2526
** - 1%, * - 5% significance level		

The next research proposition concerns a set of factors that have an impact on “work orientation/culture” of the new organisation. As Table 11 shows, the final regression equation testing H3 was achieved with two independent variables “Customer strength”, and “Time” with the F-statistic of 5.22 ($p < 0$). These variables explained 25.26% of the variance in “work orientation/culture” (Adjusted R-squared = 0.2526) and the results are insignificant. It is important to note that all the variables that were excluded from the final regression equation had no significant impact on “work orientation/culture” within organisation. The Interpretation of the equation is that “time” has a positive impact on the “work orientation/culture”. However, the variable “customer strength” has a negative impact on “work orientation/culture”, as the higher the bargaining power the customers have the stronger and more demanding they are, which affects the working environment in a negative way.

Influences of these three variables on “work orientation/culture” are presented in Figure 11 and Figure 12 below. These graphs illustrate the dependency of the “work orientation/culture” on “Customer strength and” Time” variables respectively.

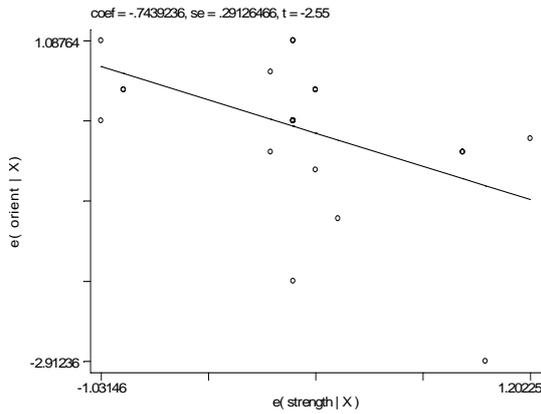


Figure 11 Customer strength

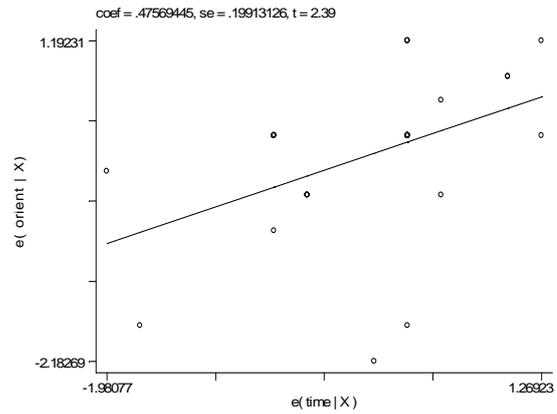


Figure 12 Time

Market / Brand recognition

The results of the regression for market / brand recognition as a dependent variable are presented in Table 12.

Table 12 Market/Brand Recognition

Dependent variable: Market / Brand recognition		
brand = 4.279 + 0.321 * propriat – 0.261 * manage		
Independent Variables		
Longitudinal effect	Proprietary position	0.321* (2.889)
	Managerial approaches	-0.261 (-2.423)
Const		4.279 (9.365)
Number of observations		70
F-stat (2, 23) = 5.18	R-squared = 0.3107	Adj R-squared = 0.2507
** - 1%, * - 5% significance level		

One the research questions concerns a set of factors that have an impact on “market/brand recognition” of the integrated organisation. As Table 12 shows, the final regression equation testing this research proposition was achieved with two independent variables “Proprietary position”, and “Managerial approaches” with the F-statistic of 5.18 ($p < 0$). These variables explained 25.07% of the variance in “market/brand recognition” (Adjusted R-squared = 0.2507) which is an insignificant result. It is important to note that all the variables that were excluded from the final regression equation had no significant impact on “market/brand recognition” within organisation. The Interpretation of the equation is that “proprietary position” has a positive impact on the “market/brand recognition”. However, the variable “managerial approaches” has a negative impact on “market/brand recognition”. This can be caused by the fact that for the integration of the organisation a specific management approach should be adopted otherwise, it creates uncertainty, hence affecting “market/brand recognition” in a negative way.

Influences of these variables on “market/brand recognition” are presented in Figure 13 and Figure 14 below. These graphs illustrate the dependency of the “market/brand recognition” on “managerial approaches” and “proprietary position” variables respectively.

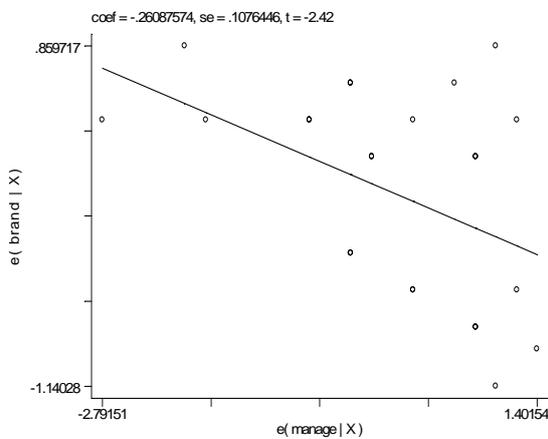


Figure 13 Managerial approaches

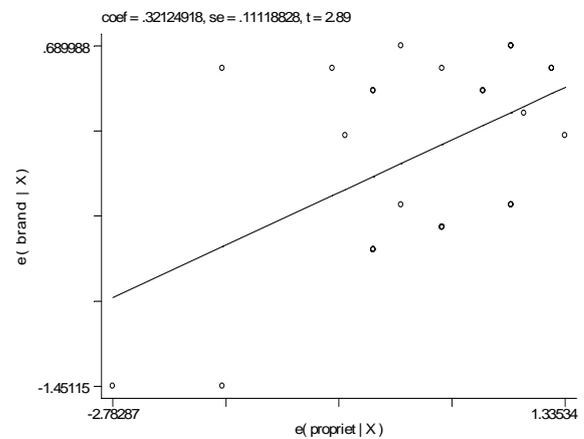


Figure 14 Proprietary position

Conclusions

The organisation under study, Albany International Inc., has been a consistent leader in the paper machine clothing industry, when it comes to its core business activity. It has achieved tremendous success during the consolidation era and is still a leader in the world market for paper machine clothing. Its realisation of the importance of adapting and fine tuning its strategy is not the only reason for its success. This paper has identified the nature of the environment in which the company is operating, the specific organisational culture, differences in management, and its particular approaches to dealing with partners and customers through the integration processes, which the author believes have contributed to the success of this organisation.

The main research propositions investigated in this paper were:

- Technology contributes to the success of the business venture in the industry under investigation.
- Cultural fit is one of the key components of the business relationship.
- Managerial factors play an important role in developing and sustaining business relationships.
- There are national differences in perceptions of cultural, managerial and technological effects on business relationships success (based on the geographical location of respondents).

The results of the survey questionnaire analysis can be summarised as follows. Looking at the research propositions set out in the research methodology, the survey questionnaire results have attempted to answer those questions and highlight some of the problems organisations face when defining what influences the success of business relationships. The three areas that were the focus of this study included technological, managerial and cultural success factors in relation to the integration of Albany

International with other partners. The following conclusions and further questions for investigation are as follows.

Firstly, R&D and technology have become cornerstones of the corporate and business strategies of Albany International. AI has a defined explicit and differentiated technology strategy in writing and has succeeded in including important technical elements in its corporate and business strategies. Furthermore respondents have linked the corporate technology strategy to the overall company strategy, which can be seen in the ratings given to the technological part of the investigation. The allocation of funds to the various R&D activities on the corporate and business unit levels demonstrates a greater importance of technology foresight. One of the important points that should be raised here is the differentiated approaches used by Albany International in acquiring technology through developing the technological competency in-house up to buying the know-how through mergers and acquisitions. There is a growing tendency of AI to acquire technology from external sources. Technology-related horizontal and vertical networking with external partners is performed even in core technology areas of the company. The high level of reliance on external sources for technology by Albany International is a very important change in the strategic management of technology over the past decade and for the future.

Secondly, the managerial index within the study has been identified as one of the key factors affecting the success of the integration between Albany international and other organisations. Analysis of managerial success factors has helped to identify the problems of communicating change within the organisation and of encouraging of employees at lower levels of the integrated organisation to participate in the change process. Another point of interest is the varying management practices identified by the participants from different geographical locations. For instance, the Japanese management style stands out as the key to business relationship success for the participants representing this part of the world.

The final element of the analysis was related to measuring the success of achieving cultural fit between Albany International and other organisations. The culture has raised a few controversial points. Problems with the formation of a new organisation correlated with the time it takes to integrate two organisations together; these have been critical elements which are not allowing Albany International to succeed with achieving a cultural fit. It was also clear from the data analysis that the understanding of what cultural fit is and how it affects success of the integration very much depends on whether the respondent represents a corporate point of view or defends the opinion of the business unit. German participants have identified the negative effects the cultural integrative processes have on the organisation.

It is clear that the success of Albany International can be measured to an extent and the main three areas which contribute to the success of the business relationship and hence its leadership position in the market of industrial textiles are: the nature of managerial practices, secondly the technological fit, and lastly the

cultural fit. It has also been identified that in the case of Albany International, the merger as a form of relationship worked for the company in insuring knowledge transfer and solid integration of the culture of the head organisation within the new partners. It is not possible to say that the findings can be generalised to any industry, however, they might represent the realities of business relationship development in technology intensive industries.

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