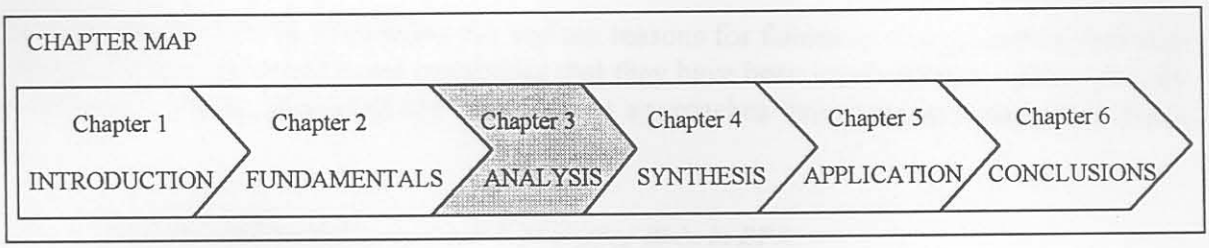
3. Analysis

3.1 Chapter context

Chapter three describes the analysis of the material available that can be directly related to business change risk, as well as the market research undertaken to form the synthesis described in the next chapter.



The Concise Oxford Dictionary [74] defines analysis as:

Resolution into simpler elements by analysing (opp. synthesis); statement of result of this.

The purpose of this chapter is to provide an analysis of the current literature, put this into a set of propositions and then to test this in the local market by means of a market research. The inferences of these two areas of research are highlighted. This analysis forms the building blocks for the synthesis of the theory in the following chapter.

3.2 Literature study: risk management of business change

The literature research is based on the five categories of business change methods described in paragraph 2.7. While an attempt was made to cover all relevant literature, the list is not exhaustive. A cross-section of the risks and management approaches as described in the literature has been formed. The major complementary thrusts have been analysed, used as being representative of the body of initiatives that are receiving most attention in literature at present. These are:

- BPR.
- Strategic alliances.
- TQM.
- Culture transformation.
- Business transformation.

While the first three focus primarily on specific groups of change types, the last two address business change issues, regardless of the change type. Culture transformation focuses primarily on the human dynamics within the organisation, while business transformation takes a pragmatic view on implementation of the change initiative. It aligns the requirements of the "hard" and "soft" sides of business change.

Some approaches have intentionally been left out. This is because they are either a sub-set of the approaches listed above, or because they dovetail so closely with various of the above approaches that their issues (risks and management thereof) are addressed accordingly. Some

of them are techniques which are instrumental in the process of the above methods. These approaches include:

- Benchmarking.
- Value engineering.
- ABC.
- ERP.
- Technology management.
- Rightsizing.
- TOC.
- JIT.
- etc.

3.2.1 Business process re-engineering

When Hammer [39] and Davenport [5] touted the concept of BPR in the early 1990s it was hailed as the panacea to dramatically bring about organisation's abilities to compete successfully in the 1990s. The researcher was in presentations where the light dawned on executives faces at the logical argument of receiving quantum leap improvement. Unfortunately as described earlier, many reasons resulted in achieving average results to failures in many respects. The father of the term "business process re-engineering", Hammer, admitted that between 50% and 70% of BPR exercises are probably unsuccessful [75].

This section describes the reasons stated in the literature for the so-called failures from a range of relevant authors.

(a) Hammer and Stanton

Hammer and Stanton [8,9] describe the top ten reasons for failure in re-engineering that they have experienced from the many companies that they have been involved with - either directly or indirectly. These, as well as the management approaches have been summarised in Table 10.

Table 10 - Hammer and Stanton's Approach to Managing Risks in BPR

Risk	Description	Techniques for Managing Risks
Don't re-engineer, but say you are	Efforts are called re-engineering because the name invites interpretation. They may be incremental quality improvement, rationalisation or automation.	• Make sure that re-engineering is understood before practising it. • Make sure re-engineering is executed and not anything else.
Don't focus on processes	Trying to apply re-engineering where it does not fit. Processes are re-engineered, not a function or organisation.	• Before re-engineering the process, they must be identified and aligned with the aims of re-engineering.
Spend much time	Too much time is spent on	• Understand, do not analyse.

Risk	Description	Techniques for Managing Risks
on analysing the current situation	analysing existing processes. Understanding is confused with full-scale analysis.	• Use the time-box approach to limit time. • Limit the length of descriptions.
Proceed without strong leadership	Re-engineering is top-down. Holistic perspective is needed. Resistance must be pre-empted. These cannot be achieved without strong leadership from the top.	• Begin and end the exercise with strong, committed, executive leadership. • Resistance must be pre-empted, not forced.
Be timid in redesign	The organisation lacks the ability to develop sufficiently imaginative ideas.	• Innovative process design and related skills must be taught. • Leaders must encourage people to pursue stretch goals and think out of the box. All new ideas should be considered. De Bono [76] and Neethling [77] recommend techniques in this regard.
Go directly from conceptual design to implementation	It is impossible to invent a new process design that will work effectively and achieve the performance breakthroughs without some trial and error.	• Before implementing an envisioned process in the "real world", create a laboratory to test the idea.[1] • Iterate until satisfactory results can be achieved.
Re-engineer slowly	Losing momentum of the re-engineering drive if the bulk of the exercise lasts longer than a year.	• Plans must be derived to show results in the short term - within 12 months. • Prevent scope creep.
Place some aspects of the business off-limits	All processes and functions integrate. Focusing on some and not others may result in the new processes not being "empowered" to operate.	• Processes must not be re-engineered in isolation. • Do not set limits to preserve a piece of the old system.
Adopt a conventional implementation style	A style of implementation not suited to process re-engineering is adopted.	• Use the correct approach to re-engineering implementation: fast, improvisational and iterative.
Ignore the concerns of people.	The underlying concerns of how people should behave in the future and how they will be rewarded are not addressed sufficiently.	• The personal needs of individuals must be considered. The new business must offer some benefits to the people in the "life after" re-engineering.

[1] Marcam Solutions have an implementation approach called AIM where BPR and ERP system implementation are integrated. Once the conference room pilot (CRP), (where the designed are developed and integrated) has been executed, a critical test phase called the business pilot (BP) is undertaken. A rigorous "real-world" situation is tested by experienced individuals. SAP has an approach which is different, but the objectives are similar.

Hammer indicates the need to address a few further risks however [8], namely:

- Communication must be clear, concise and frequent.
- The rigours of BPR are underestimated.
- Groups of people are not fused into cohesive, focused teams.

These risks along with the methods used to manage them are similar to those described by Kotter [7].

(b) Clemens

Clemens proposes that re-engineering remains risky whether too little effort or even if enough effort is put in [78]. He describes 5 risks typical of large scale system implementation listed below:

- **Financial Risk** - The risk that the project cannot be brought in on time and on budget. The justification for system investment may be jeopardised.
- **Technical Risk** - The capabilities of the technical solution are incapable of providing the desired solution.
- **Project Risk** - The project will not be implemented as planned due to issues impacting on the project.
- **Functionality Risk** - Completed systems do not have the required functionality.
- **Political Risk** - Systems are not completed due to organisational change, resistance or loss of commitment to the project.

This was the typical risk profile of MIS implementation during the 1970s and 1980s, with the relative weights of the risks listed accordingly. He believes however that the importance of these risks have reversed in weight, with political and functional risk being the most important in contemporary MIS implementation. A change in mindset and management techniques has to be adopted by MIS implementers. He adds that senior personnel need to achieve this to implement re-engineering successfully.

Clemens believes that sound business revisioning is pertinent to managing the risks relating to functionality. In order to manage this appropriately, he advocates the use of scenario planning[1].

[1] Analysis of this technique is provided later.

(c) Bently

Bently while not identifying the risks of BPR, provides a list of 6 factors of human and organisational development that need to be put in place in order for the BPR exercise to be successful [79]. These are listed as follows:

- **Core activities and core people** - The first stage must be to focus on the core activities and people and then to examine how they can be encouraged and/or released to optimise their performance.
- **Creativity and productivity** - Creativity of the core people must be released. working with empowerment, productivity can be increased significantly.
- **Diversity and innovation** - Participation and individuality must be unleashed, allowing talents to develop into innovation.
- **Focus on the ordinary** - Creativity and innovation focused on ordinary business aspects will turn them into extraordinary and competitive advantage.
- **Attend to the obvious** - Often the obvious is overlooked. This should also be focused on to test the fundamentals.
- **Spotlight fascination** - There is always a fascinating element of the organisation, e.g. products, processes, etc. This fascination or uniqueness should be highlighted as a theme.

(d) Hall et al

Hall et al [80] provide general areas that require attention when undertaking a re-engineering exercise. These are:

- Ignore global effects - A holistic approach is required to bring about improvements to the business entity. Individual processes should not be tackled in isolation.
- Lack of commitment - Absolute commitment must be ensured from top management.
- Lack of emphasis on customer needs - The needs of the customer should be the focus of the exercise or long term profitability will suffer.

(e) Fortnum and Wiebe

Fortnum and Wiebe [81] (KPMG) define three levels of BPR, namely functional improvement, process redesign and business rethinking. They add that the higher the level, the higher the risk. They list the following important risk management factors:

- Management commitment and leadership to manage the human aspects.
- Use of experienced external consultants to assist in guiding the organisations past the pitfalls.
- A phased approach is used where risks are identified at each and appropriate management actions initiated.

(f) Carr and Johansson

Carr and Johansson [82] undertook an investigation where 47 companies were researched in order to assess the best practices in BPR. The results of the research along with their experiences have been listed in Table 11.

Table 11 - Carr and Johansson's Risks and Best Practices for Managing BPR Initiatives

List of Risks	List of "Best Practices"
• Undertaking efforts with limited goals. • Less than full commitment. • Poorly defined processes. • Lack of strategic focus. • Inability to meet high expectations in BPR. • Failure to appreciate risk factors. • Insufficient change management attention. • Poor communication. • Attempt to re-engineer too many processes. • Not setting performance measures.	• Focus of core business processes, linked to the customer. • Radical change in thinking and working (behaviour). • dramatic improvement (performance critical to competitive advantage). • Recognise and articulate compelling need to change. • Executive level support. • High level of communication. • Create top-notch teams. • Use a structured framework. • Use consultants effectively. • Listen to the voice of the customer. • Select the processes for re-engineering. • Maintain focus: hold scope. • Maintain teams as a key vehicle for change. • Come to an understanding of the current processes quickly. • Choose and use the right metrics. • Understand the risks and develop the right contingency plans. • Have plans for continuous improvement. • Leadership is the driving force for change. • Growing use of modelling and simulation tools.

(g) Champy

Champy addresses a different aspect of managing risks in the re-engineering environment [83]. He believes that many of the failures of BPR can be laid at the feet of management itself. He indicates that an integral part of the re-engineering of the business requires the re-engineering of management itself. The reason for this is that the traditional management model (nurtured by Sloan, Weber, Fayol, etc.) is better suited to the business environment of more than 10 years ago where business was more or less static.

(h) Petrozzo and Stepper

Petrozzo and Stepper [84] have provided a method for successful engineering. The identification of risks and management techniques are similar in nature to those described earlier. They do however venture an additional risk of making assumptions using insufficient information that needs to be managed.

(i) Martin

Martin [55, pp474-475] describes the characteristics of a re-engineered enterprise as well as the barriers to achieving these characteristics. These have been summarised in Table 12.

Table 12 - Martin's Characteristics and Barriers to Achieving a "Re-engineered Enterprise"

Characteristics of the Re-engineered Enterprise	**Barriers to Achieving these Characteristics**
Empowered employees excited about reinvented value streams.	Management is cynical about empowerment. Functional managers resist cross-functional teams.
Change from a bureaucratic hierarchy to flexible cross-functional teams.	Top management wants a hierarchical system because it provides them with power.
Reward system that helps motivate value stream teams.	Top management will not change their top-heavy reward system.
New relationships with trading partners in which both sides benefit.	An attitude of "we do not trust vendors" makes reinvention of alliances difficult.
IT systems which get the right information at the right time to cross-functional value-stream teams.	Managers with their own fragmented databases resist data sharing.
A culture sharply focused on delighting customers.	The corporate culture blocks cultural changes in diverse ways.
Fast, fluid, flexible, knowledge infrastructure which supports reinvented value streams.	Mainframe computers systems are difficult to change. IT resents change.

The author proposes that one or more effective ways of determining the risks of BPR is by means of the Ishikawa diagram (described earlier). Once the risks have been identified, these can be limited to Pareto diagrams to evaluate the relative dangers of the risks. This can be facilitated by means of existing PC software tools. He provides 3 generic Ishikawa diagrams identifying the risks linked to the 3 re-engineering phases of:

- Phase I - Design
- Phase II - Implementation
- Phase III - Starting Operations

These are shown in Figure 22, Figure 23 and Figure 24 respectively.

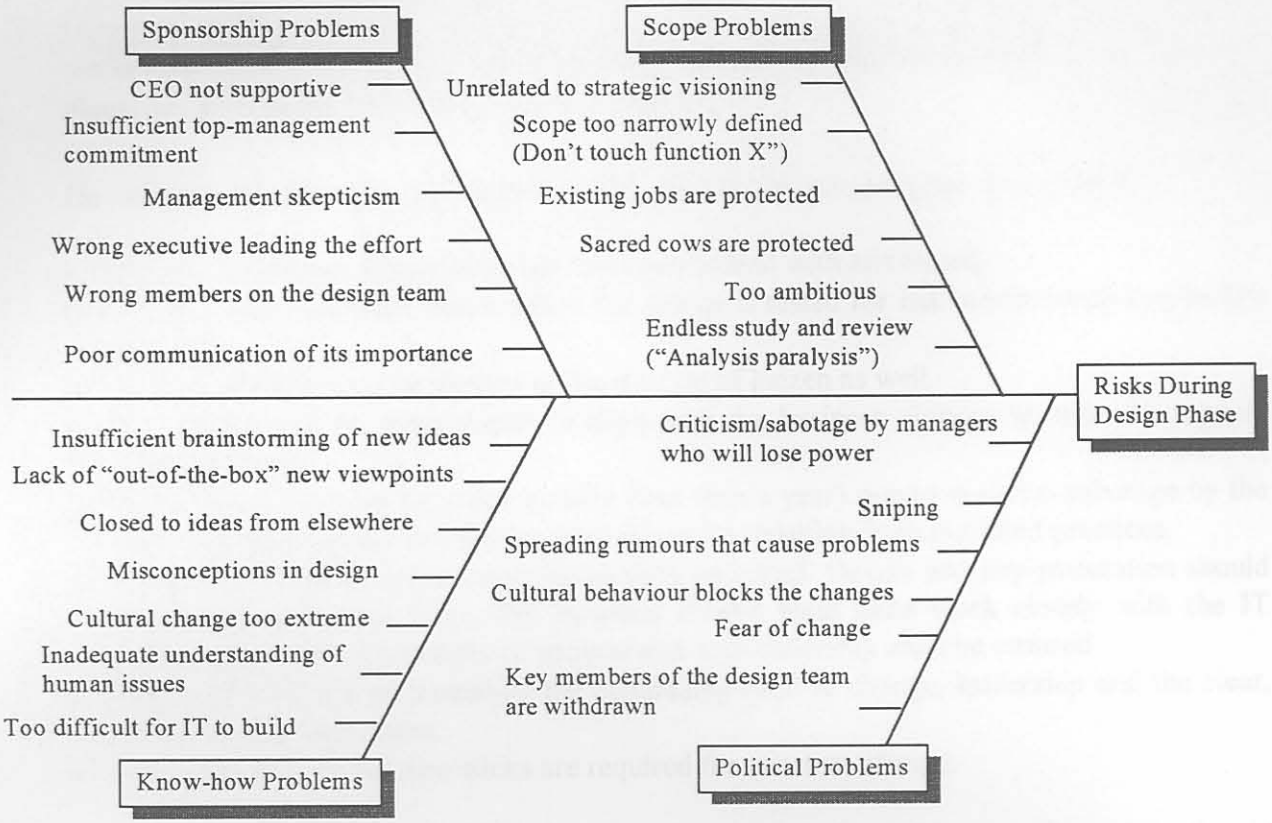


Figure 22 - Risks during BPR Design Phase

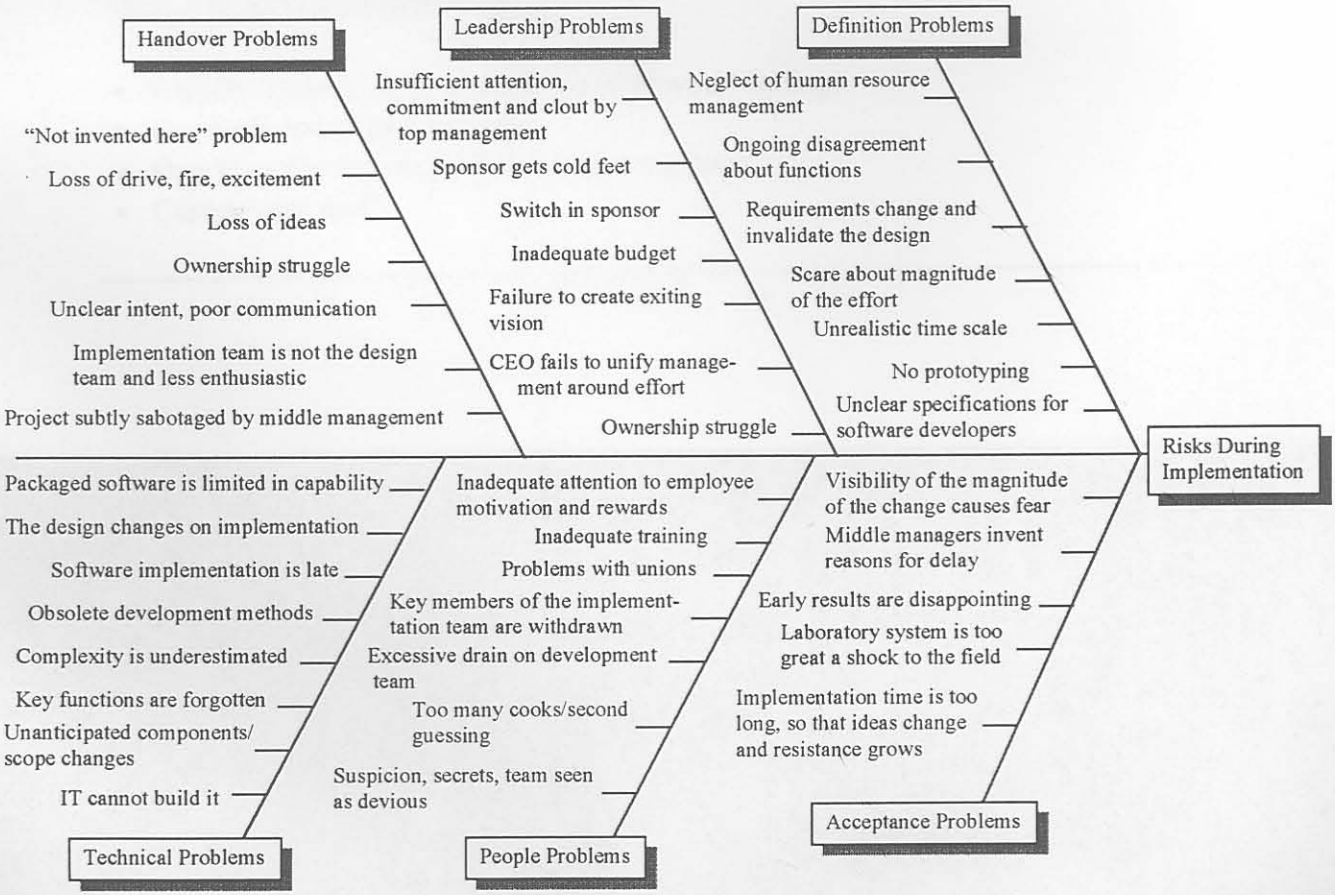


Figure 23 - Risks during BPR Implementation Phase

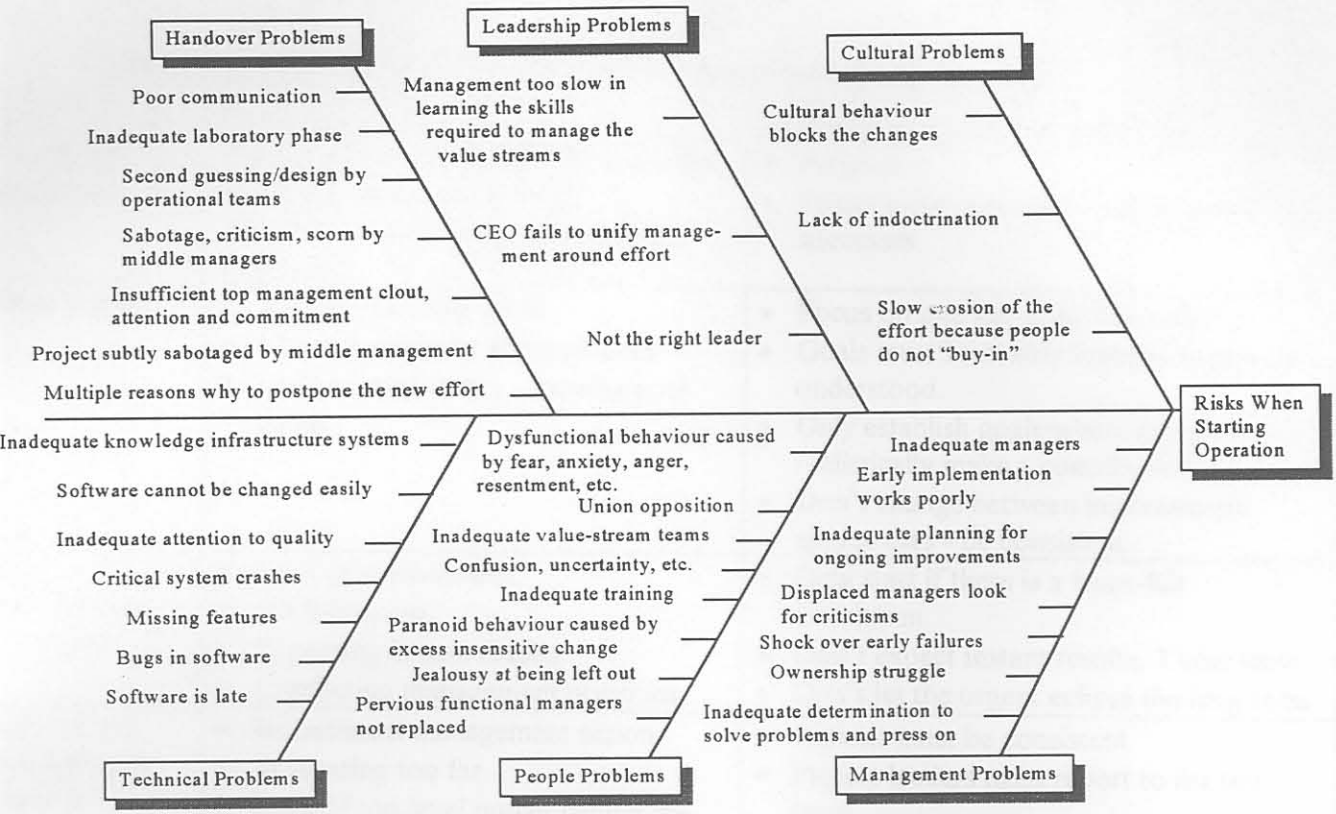


Figure 24 - Risks during BPR Operation Start-up Phase

He indicates the following techniques/success criteria for managing the risks in BPR:

- Use of a laboratory where ideas can be experimented with and tested.
- Use of a pilot operation phase where the design is tested for real-world conditions before going live.
- Start-up of BPR must be viewed as the start up of kaizen as well.
- IT systems must be redeveloped to align with the business changes in order to support these effectively.
- The BPR needs to be instituted quickly (less than a year) due to eventual sabotage by the non-committed people and the business dynamics resulting from outdated practices.
- Hand-overs between teams must be carefully executed. Design and implementation should be done by the same team. The business change team must work closely with the IT development team. Continuity of sponsorship and leadership must be ensured.
- Fears and RTC are addressed by the compelling need to change, leadership and the clear, relentless communication.
- Use of rewards rather than sticks are required for constant change.

He further indicates that the psychological comforts are facilitated in an environment of rapid change by means of the following:

- Careful coaching with attention to employees' feelings.
- Good education and training.
- Opportunities for practice with support groups.
- Carrots, not sticks.

- No punishment.
- Encouragement to overcome the shame associated with making errors.
- Encouragement of experimentation.
- Rewards for innovation.
- Esprit de corp.
- Clear team goals.
- Constant demonstration from management that innovation is important.
- A fully supportive environment.
- Full communication from management about business direction and reasons for actions.

3.2.2 Transforming company culture

Drennan [52] describes the inherent risks involved in implementing a change in culture. These risks, along with his recommendations for managing these are summarised in Table 13.

Table 13 - Drennan's Approach to Managing Risks in Transforming Company Culture

Risk	Description	Techniques for Managing Risks
Quick fix answers	The temptation of looking for quick-fix answers in the light that the transformation of corporate culture takes time.	• Patience • Foster early champions and publicise the successes.
Goal setting	• Setting too many goals. • Not actionable by all employees. • Lack of consistency - moving goal posts.	• Focus on one key goal, 3 at most. • Goals must be clearly communicated and understood. • Only establish goals where everyone can realistically make a contribution. • Don't change between improvement approaches - be consistent.
Top management problems	• Lack of commitment. • No follow-up. • Expecting instant results. • Conflicting management priorities.	• Only start if there is a heart-felt conviction. • Don't expect instant results, 3 year view. • Don't let the urgent eclipse the long term.
Lack of top management control	• Inconsistent management action. • Delegating too far. • Lack of top level power behind the programme.	• Actions must be consistent. • Project leaders must report to the top team. • A programme manager must have top management authority.
Middle management resistance	Middle management feel threatened by the change and adopt actions aimed at undermining the initiative.	Spell out the role of middle management and get then actively involved in the change process.
Employee resistance	Resistance stemming from the insecurity of the future.	• Address employees concerns directly. • Start with the more willing employees and build on early successes.
No change in structures	The old structures and mechanisms are not aligned with the new requirements - slip back into old behaviour patterns.	Consciously introduce structure shifts, i.e. changes in organisation, procedures, documentation, measures, etc.

Risk	Description	Techniques for Managing Risks
Training problems	• Skimping. • Poor planning. • No follow-up.	• Invest in training for long-term gains. • Plan systematically. • Follow up on training with post event action steps.
Company size	The older and larger the company, the more difficult to institute change.	• Have a clear goal. • Use common language. • Set challenges. • Transfer ownership. • Measure constantly. • Follow-up. • Assume wave of successes over the years. • Communicate constantly.
Lack of persistence	Not having perseverance through with the initiative due to internal or external influences.	Use vision and persistence.

Scott-Morgan [51] indicates that the largest risk in changing organisational behaviour lies in the misalignment between the written rules and the unwritten rules of the organisation. He proposes that behaviour is directly coupled to the methods required to achieve the perceived measures. The risks and techniques are described in more detail later.

3.2.3 Business transformation

This section evaluates the risks and management techniques purported in the literature to deal with business transformation in general.

(a) Kotter

Kotter [7, pp59-60] believes that there a two general lessons to be learned from the failures businesses have experienced in the past decade. He writes:

"The most general lesson to be learned from the more successful cases is that the change process goes through a series of phases that, in total, usually require a considerable length of time. Skipping steps creates the illusion of speed and never produces a satisfying result. A second very general lesson is that critical mistakes in any of the phases can have devastating impact, slowing momentum and negating hard-won gains."

He has summarised 8 general risks that need to be managed. These are shown in Table 14.

Table 14 - Kotter's Approach to Managing the Risks of Transformation Efforts

Risk	Description	Techniques for Managing Risks
No sense of urgency	No great sense of urgency established due to (1) under-estimation of effort needed to drive people out comfort zones (2) executives are too concerned about the down-sides (3) Too many managers are not leaders.	Establish a sense of urgency: • Examine market and competitive realities. • Identify crises, potential crises and opportunities. • Indicate that the status quo is worse than the future. • New leaders to lead whenever the change is to be enacted.
No powerful guiding coalition	The risk of not having a team with critical mass and enough weight in the organisation to make things happen.	Form a powerful Guiding Coalition: • Assemble a group with enough power to lead change. • Encourage the group to work together as a team. • Ensure management commitment
Lacking a vision	Not having a vision to drive action towards.	Create a vision: • Create a vision to help direct the change effort. • Develop strategies to achieve the vision.
Under-communicating the vision	Risk that cynicism or confusion creeps in due to the lack of information. Use of standard old communication approaches.	Communicate the vision: • Use every vehicle possible to communicate the new vision and strategies. • Teach new behaviours by example. • Institute frequent Q&A sessions.
Not removing obstacles to the new vision	Often people want to make the vision materialise. Barriers like their own personality, organisational structures, job descriptions, etc. can stand in the way.	Empower others to act on the vision: • Remove obstacles to change. • Change systems or structures that undermine the vision. • Encourage risk taking and non-traditional ideas, activities and actions.
Not systematically planning for and creating short-term wins	Transforming takes time, and a renewal initiative risks losing momentum if there are no short-term goals to meet and celebrate.	Planning for and creating short term wins: • Plan for visible performance improvements. • Create those improvements. • Recognise and reward involvement.
Declaring victory too soon	Celebrating a win is good for morale, declaring the war won is catastrophic. Until changes sink deeply into a company's culture, new approaches are fragile and subject to regression.	Consolidate improvements and produce more change: • Change systems, structures and policies that don't fit into the vision. • Hire, promote, develop employees who can implement the vision. • Reinvigorate the process with new projects, themes and change agents.
Not anchoring changes in the	Until new behaviours are rooted in social norms and shared	Institutionalise new approaches: • Articulate the connections between new

Risk	Description	Techniques for Managing Risks
corporation's culture.	values, they are subject to degradation as soon as the pressure for change is removed.	behaviours and corporate success. • Develop the means to ensure leadership development and succession.

The techniques to managing the risks provide the basis for his 8 step approach to transforming an organisation regardless of the management improvement initiative under consideration.

(b) Martin

Martin [55, pp487-489] puts forward that the different change types have different risk profiles. These have been consolidated into Table 15.

Table 15 - Risk Profiles of the 5 Change Types

Change Type	Risk Profile
Kaizen	Kaizen/TQM can be accomplished with little change to the organisation structure. A major change in culture and reward system is however required. Successful organisations focus primarily on bringing about a cultural change.
Procedural design	This approach avoids pervasive structural and cultural change. This in itself is an approach chosen when the risk of a BPR upheaval are too high. The change initiative is limited to a particular area of the enterprise.
Value-stream design	This involves a radical change in both structure and culture. It deliberately eliminates sacred cows. The team tends to be isolated, with radical thoughts, sometimes even for the sponsor. The design needs to be piloted in a laboratory and then eased into the organisation. The teams require significant cultural transition to support themselves.
Enterprise design	When the organisation faces changing its raison d'être a daunting cultural change is needed. The structured cultural transition is a huge task. Companies successful with these transitions tend to have competencies in these areas to derive competitive advantage. Building a new part of an organisation at a new site is often more desirable than attempting to change a strongly embedded resistive change.
Strategic vision	The cultural issues involve top management itself. The changes often go against their beliefs and external consultants are required. The change efforts at this level typically reverberate throughout the remainder of the organisation. Ideally the purpose is to produce an emerging effect that transforms culture from the top down.

The author summarises this relationship in Figure 25.

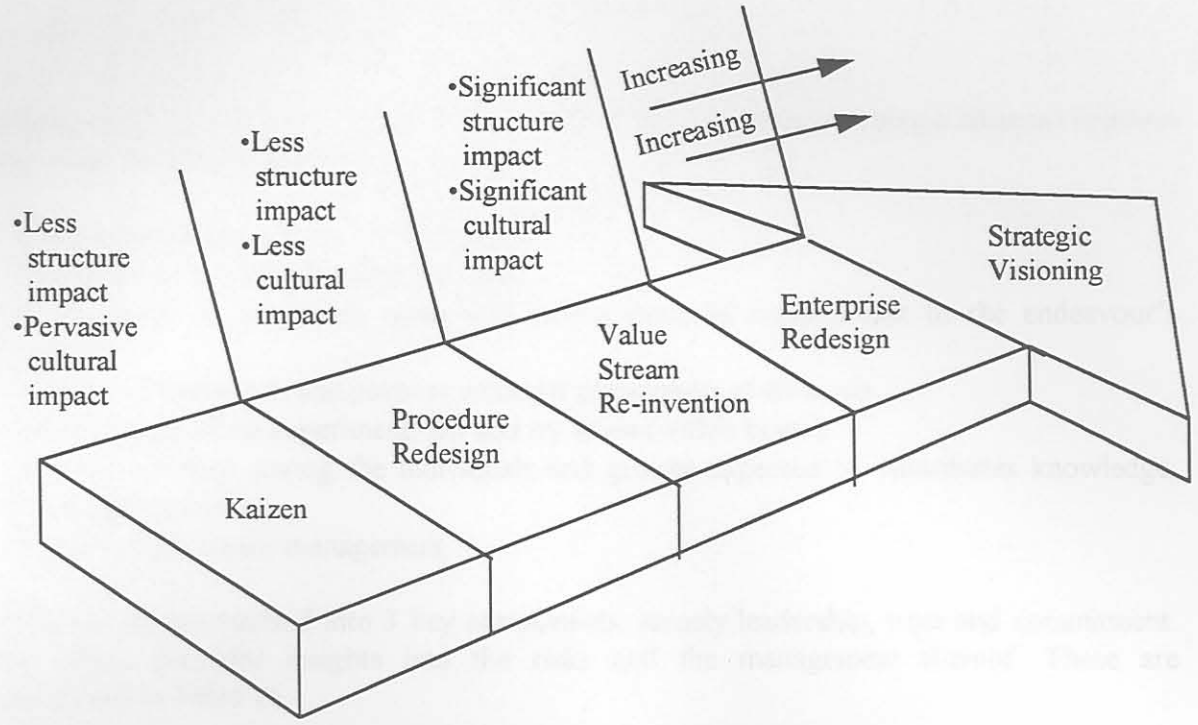


Figure 25 - Martin's Risks Associated with Different Change Methods

(c) Organisational risk propensity

The following describes research on risk propensity in organisational decision-making context. Walls [85] conducted a study into risk propensity to determine whether there where variances across management and functional designations. From his study he concluded[1] that:

- Lower level staff exhibit higher risk aversion levels than supervisory or managerial level employees.
- There is no statistical difference in risk propensity between supervisory and managerial designations.
- Lower level staff use their own outcomes (career) rather than business outcomes (ROI) as basis for decision-making.
- There is a significant risk propensity between disciplines in an organisation which may suggest failure by management to communicate a consistent organisational risk policy.
- He further felt that "*choice behaviours change when attention turns from the behaviour of isolated individuals to the behaviour of individuals within the organisational context.*"

He suggests the following approaches to risk management (taken in context of the above findings):

- Organisational risk management strategies should be implemented to assist effective and consistent decision-making.
- Compensation and incentive structures consistent with an environment for risky decision-making should be established as organisational motivators.

[1] While his test case was based on BP, he draws correlation with other studies.

- Managers should at least be partially evaluated on the basis of their outcomes[1].
- The above results in:
  - a need for more sophisticated personnel appraisal.
  - encouraging transparency and capturing of decision-making before their outcomes are known, and
  - encouraging group decision-making and shared responsibility.

March and Shapira [86] found that managerial risk taking, albeit complex, generally varies according to incentives and experience. It is tightly coupled to the individuals' career scenarios within the organisation.

Swalm [87] also observed that lower levels in an organisation have a lower risk propensity than higher levels. He further concludes that management generally take decisions suitable to their personal interests before organisational interests.

3.2.4 Strategic alliances

(a) Badaracco

Badaracco [88, p130] indicates that understanding how to manage strategic alliances involves examining the following factors:

- Clear sense of the project's objectives.
- Incentives to build knowledge and skills.
- A champion or leadership team with strong personal commitment to the endeavour's success.
- A sense of teamwork and purpose amongst participants at all levels.
- Encouragement, to experiment, fail and try again (within limits).
- A sense of trust among the individuals and groups expected to contributes knowledge, skills and resources.
- Support from senior management.

These can be summarised into 3 key components, namely leadership, trust and commitment. The author provides insights into the risks and the management thereof. These are summarised in Table 16.

[1] This disallows the outright vetoing of higher risk-return options.

Table 16 - Badaracco's Approach to Managing the Risks of Strategic Alliances.

Risks	Description	Techniques for Managing Risks
Haste to consummate a deal that fills an urgent need	In the haste to satisfy a need an alliance is negotiated. This may make sense for the individual deal, but holistically can cause strategic damage.	• Managers must have a clear, strategic understanding of their company's capabilities and the capabilities it will need in the future. • Specific risks are uncovered by analysing the expected half-life of the core capabilities of the company.
Selecting the incorrect structure	This involves risks around chasing the correct partner, mutual activities and form of relationship.	• Managers must consider a whole range of possibilities.
Incompatible values and culture	The prospective cultures are different, making the operational relationship difficult. For example, centralised vs. decentralised decision-making.	• Managers must scrutinise the values, commitment and capabilities of the prospective partners.
Partnering risks	• Risks of opportunism and self-interest. • Risks that knowledge and capabilities will flow in unintended and harmful ways.	• Managers must understand the risks of opportunism, knowledge leaks and obsolescence.
Alliance dependency	Organisation sustainability and independence is at risk if the alliance is tightly coupled with the core capabilities.	• Avoid undue dependence on alliances.
Operational risks	Day to day management of the operation with disparate systems, different staff, 2 bosses, etc.	• The alliance must be structured and managed as a separate company (ringfencing).
Inflexibility	Mistrust whatever its origins, breeds inflexibility.	• Trust must be established.
Misaligned organisational interfaces	Processes between organisations are not aligned to facilitate the ease of working between the companies.	• Change core operations and traditional organisations to be open to learning from alliances.
No direction and drive	No urgency, direction, inflexibility or commitment.	• Alliances must be led, not managed.

(b) Lorange et al

Lorange et al [89] approach the development of strategic alliances from a parental perspective, i.e. two legal entities giving birth to another where both have vested interests. They identify 10 major challenges that require attention [89, pp9-10] in order that a strategic alliance may be successfully established. These are:

- Autonomy of the new unit.
- Maintaining forward momentum.
- Focus on the external environment.
- Politicking amongst stakeholders.
- Change and innovation.

- Learning
- People - company, not just an individual effort.
- Black-box (hedging, ringfencing, etc.).
- Cultural alignment.
- Co-operative effort.

3.2.5 Total quality management

TQM is another of the new business improvement panaceas that have come under fire for not achieving what it was set out to do [59,90,91,92]. This section describes what relevant literature has cited as the risks of instituting TQM and the techniques used to manage this.

(a) Ackoff

Ackoff [59] indicates the need for TQM but highlights areas where risks lurk. He however suggests techniques for dealing with these. This has been disseminated and summarised into Table 17.

Table 17 - Ackoff's Approach to Managing the Risks of TQM/Continuous Improvement

Risk	Description	Techniques for Managing Risks
Focus is not on all stakeholders, esp. consumers	• The expectations of not all stakeholders are met. • There is a chain of customers ending up in consumers. They may have different needs, hence different perceptions of quality.	• Understand the needs of all stakeholders. • Use consumer idealised design (CID).
Focus on elimination of defects	Defect and deficiency removal provides no assurance of attaining something more desirable than what is left behind.	Continuos improvement programmes should be directed at getting what people want, not getting rid of what they don't want.
Focus only on continuous improvement	Continuous improvement is at best a way of trying to catch up, creative (dramatic) leaps are required to take the lead.	• Use continuous and dramatic improvement approaches as complementary to achieving the goal. • Use of creativity stimulation techniques [93].
Sub-optimal solutions	Defects are observed independently and therefore addressed separately.	• Systems approach. • Setting a common vision.
Deductive risk	TQM programmes focus on trying to go from where one is, to where one wants to go.	• Use the reverse (inductive). Work backwards from where one wants to be to where one is, i.e. vision, e.g. dynamic programming. • Scenario planning. • Contingency planning.
Implementing contemporary initiatives in a traditional framework.	TQM has its origin in SQC. Over time additional practices accumulated under its banner. Various components do not hang together as a cohesive whole. Traditional management and organisational approaches, hamper the change. This includes organisation, measures and styles.	• Use of the circular organisation [59, pp110-141] vs. the hierarchical organisation. • Use of the multi-dimensional organisation [59, pp168-196].

(b) Brown et al

Brown et al [90] have provided a comprehensive work on the risks of instituting TQM. They also provide lengthy measures and approaches aimed at managing the initiative in order that it may successfully be implemented. The authors describe three phases for implementing TQM, namely:

- Phase I: Start-up.
- Phase II: Alignment.
- Phase III: Integration.

Using this framework, they provide a way of dealing with the generic reasons for failure. This framework depicting the risks and coupled techniques has been summarised in Table 18, Table 19 and Table 20 according to phase.

Table 18 - Brown et al's Approach to Managing the Risks of TQM – Phase I

Risk	Description	Techniques for Managing Risks
Lack of management commitment	Executives are sometimes attracted to TQM for the wrong reasons. Even if they implement TQM for appropriate reasons, they often don't know how to support the effort.	• Commitment is a personal attribute - from within and cannot be imposed. Must be from the heart. • This commitment must then be demonstrated - leadership. The authors provide 8 ways to demonstrate commitment [90, pp7-17].
Poor timing and pacing	• Sometimes organisations must experience a financial crises before implementing TQM. Required resources for implementation are therefore limited. • Others fail because there is no compelling need identified to implement TQM. • Employees may be overwhelmed with overlapping, competing change efforts.	The following factors were identified in sequence of importance: • Establishing and communicating the threat of survival. • Establishing employee commitment. • Use of appropriate implementation strategy. • Focus is on achieving real progress in the implementation. • A 3-5 year plan is put into place detailing goals addressing predetermined success criteria.
Wasted education and training.	The education and training required is enormous. Funds are spent on the wrong training or it is implemented in the wrong way. Executives then abandon them for tangible returns.	• Focus the training on the needs of the organisation. • Ensure appropriate context and method.
Lack of short-term bottom-line results	TQM is a long term strategy. Organisations are led to focus on process and not results, when scare resources are poured into the initiative. When business get tight, TQM is dropped as a "nice-to-have"	• Measure results using appropriate indicators. • Focus on achieving results and not only behaviour. • Focus on process control. • Focus on the customer's needs. • Focus on long-term strategies with relevant measures.

Table 19 - Brown et al's Approach to Managing the Risks of TQM – Phase II

Risk	Description	Techniques for Managing Risks
Divergent strategies	Organisations consider TQM "another programme" and do not integrate it as inherent to the new way forward.	The following aim at not making TQM just "another programme": • Don't give it a slogan, esp. one that can be abbreviated. If required, make it consistent with the business vision. • Defocus on fan-faire, focus on achieving continuous improvement. • Either don't appoint a quality chief or make clear that this is a temporary position. • Don't build a separate TQM department. • Make quality issues part of daily operational practice – not special committees.
Inappropriate measures	The wrong measures are used to gauge the performance – usually easy-to-get measures. Measures are also used to punish, not to facilitate the learning process.	Indexes are created that measure the following variables: (1) customer satisfaction, (2) financial, (3) product/ service quality, (4) employee satisfaction, (5) operational (6) public responsibility. Measures must be based on issues that can be controlled.
Outdated appraisal methods	Traditional performance appraisal systems encourage competition instead of co-operation, they reinforce traditional management practices instead of empowerment and they focus on the manager's desires, not the customers'.	The authors believe the following principles should be employed [94]. • Merge planning and feedback into a team meeting. • Design the meeting around thought provoking questions. • Align the timing of the appraisal with work. • Eliminate individual ratings. • Provide individual and team feedback. • Incorporate data about customers and competitors. • Design a natural way to document results.
Inappropriate rewards.	Traditionally, compensation systems focus on individual and not team based performance. Now methods like gain-sharing, skill-based pay and executive compensation also have problems.	The following systems are recommended: • Incentive based pay for all employees. • Performance based compensation. • Bonuses tied to customer satisfaction. • Pay for service. • Pay at risk.

Table 20 - Brown et al's Approach to Managing the Risks of TQM – Phase III

Risk	Description	Techniques for Managing Risks
Failure to transfer true power to employees	Middle level managers feel threatened when employees are encouraged to take action with the recommendations they devise.	• Empower employees. • Make use of self-directed work teams.
Maintaining outmoded management practices.	Inconsistencies in behaviour from management - not "walking the talk".	Empower management with a new management style - from the traditional planning, organising, leading and controlling to coaching, consulting, cheer leading and co-ordinating [95].
Poor organisation and job design	Implementing a style that requires fluid organisation and employee empowerment conflicts where currently the organisation is hierarchical and decision-making is taken by and executed by management.	Design a flexible management organisation using the 8 S's [95], namely: strategy, skills, structure, systems, symbols, staff, style and shared values. Job design should be based on: • Organising to maximise customer satisfaction and quality. • Put interdependent people together. • Provide meaningful feedback and consequences. • Eliminate/distribute "bad jobs". • Team members should be multi-skilled and manage themselves.
Outdated business systems	Many "bespoke" systems have been tailored to suit outmoded business practices.	The systems developed for the traditional approach need to be replaced or redesigned to support the new processes and philosophies.
Failure to manage learning and innovation diffusion.	Innovative solutions are generated in pockets. Failures are kept under wraps. The learning is never assimilated into the rest of the organisation.	Develop and organisational learning culture.

The authors add an important factor which is similar to the risks and management techniques, of all the other business improvement initiatives. The problems incurred tend not to be mutually exclusive. They write [90, p3]:

"excessive training experiences can lead to the lack of bottom-line results, which can lead to the lack of executive commitment. However, with a focused plan and strategic use of training and executive time, organisations can achieve dramatic successes in phase I that will help fuel excitement for phase II."

(c) Bechtell

Bechtell [73, pp305-307] proposes the following 9 techniques to mange the successful implementation of a TQM initiative:

- Focus on the customer.
- Stream-line the processes.
- Use partnerships and teamwork to solve problems and reduce waste and costs.
- Create a system to achieve continuous improvements in quality.
- Provide constancy of purpose and urgency of action.
- Managers must work on the system.
- Invest in creating a learning organisation.
- Take the lead, walk the talk.
- Focus on the critical few, not the trivial many.

3.3 Market research: managing the risks of business change

This section describes the market research which combines the foregoing literature research with expert inputs into a set of propositions. It further describes the process, analysis and conclusions drawn from the market research.

3.3.1 Method

(a) The research question

The research problem lies in understanding the nature of the risks associated with the change of business practices in South Africa. In particular, the research aims to look at the varying forms of change that take place, the types of risks attributable to the particular forms of change, and the way that risks associated to these changes are managed in practice.

(b) The research propositions

Proposition 1:

> There are 6 types of changes that can be undertaken by a business to improve the bottom-line. These are continuous improvement, procedure redesign, value-stream reinvention, enterprise redesign, strategic visioning and financial optimisation. These changes are common to all industries.

Proposition 2:

> There are firstly, generic risks attributable to business change in general, secondly to the type of change under consideration, and thirdly, risks unique to the particular industry and or business.

Proposition 3:

Failure of business change initiatives are largely attributable to the lack of appropriate risk management.

Proposition 4:

The perceived benefits and problems associated with risk management will reflect those described in the literature and experience.

Proposition 5:

There is a growing use of and demand for risk management in business change initiatives.

Proposition 6:

Local businesses do not institute formal or sophisticated risk management practices.

(c) Research Methodology

(i) Selection of research method

The research method selected entailed the descriptive survey technique. The vehicle used to seed the analysis entailed the mailing of questionnaires to a selected target group within the population of the chosen database. This approach is motivated by virtue of the exploratory nature of the research conducted. To satisfy the exploratory requirements of the research, a broad cross-section of the business environment was selected even though the elected database is in itself a sample of the larger population.

(ii) Population

The database population under consideration comprised of approximately 700 organisations in South Africa covering a wide spectrum of companies. The database used was made available by Paras[1] which included large corporations down to medium sized enterprises. Another database was made available which included in excess of 2000 top European process industry contacts. This was however decided against firstly for practical engagement reasons and secondly because the focus on the South African industry was felt to be more appropriate for this particular study.

This database did however have duplications per company due to more than one targeted person in some companies. It was felt that in order for an objective response to be provided, the top official in each organisation, where possible should be targeted. This generally involved the general manager or managing director. With this approach as rationale, along

[1] Paras is an international management consultancy focusing on business, information and technology strategy. It head office is based in the UK, but most of the work was done via the South African office.

with the elimination of several records having incomplete information, a final database of 414 potential respondents was established.

(iii) Sample

A 10% response rate is considered reasonable in research involving questionnaire based surveys [96]. The target number of responses is in the region of 40 which necessitates a potential respondent population size of 400. This is achieved if the entire final population of 414 as described above is employed.

(iv) Questionnaire administration

The questionnaire was drafted in order to test the research propositions and objectives adequately. This was then piloted on a small sample for the purposes of eliminating inconsistencies and errors that may detract from the quality of the final analysis. Feedback from a captive audience was procured and used to improve the quality of the questionnaire [97].

A covering letter which accompanied the questionnaire was written which indicated the importance of the study [98]. These were mailed to the potential respondents along with a pre-paid reply envelope. The covering letter and the questionnaire is shown in appendix I.

Of the 414 questionnaires mailed out, 44 replies were received, of which only 42 were useable. This implies a response rate of 10.1% which satisfies the reasonable return requirements described earlier.

(v) The research objectives

The research objectives were formulated as follows:

Objective 1:

To investigate the nature of the different types of business change in the different industries in South Africa.

Objective 2:

To investigate the nature of the risks associated with the different types of business change in the different industries in South Africa.

Objective 3:

To determine the impact a lack of thorough risk management has on the success of business change initiatives.

Objective 4:

To investigate the benefits and problems associated with risk management in initiating and managing change.

Objective 5:

To investigate the use and need for risk management in instituting business change.

Objective 6:

To investigate the extent of usage and sophistication of risk management methods and tools used in the activities related to the successful change of business.

(d) Questionnaire format

The questionnaire has the following format:

Section 1: Information regarding the respondent

Section 2: Demographic information

Section 3: Organisation's experience with business change

Section 4: Organisation's approach to risk management

Section 5: Respondent's opinions regarding risk management in business change

Where possible, closed-ended questions were employed to eliminate ambiguity and hence inconsistency or lack of replies. Opportunity for feedback via open-ended questions was also provided in order to provide insights beyond those provided by the literature study.

(e) Approach to data analysis

Section 1 (questions A, B and C) reflect on the respondent and the organisation replying to the questionnaire. This was to serve primarily as reference in the case of a need for clarification from the respondent and also to ascertain the perspective of the respondent within the organisation.

The following section (questions 1 and 2) relates to the demographic characteristics of the respondent. In both cases pie charts are employed to illustrate the respective sample distributions.

Section 3 (questions 3 to 7) endeavours to understand the organisations' experience in respect of business change. The "recentness" of change undergone by an organisation is depicted via a pie chart as well as the organisation's rating of the respective success of this change. In each case percentages and limited descriptive statistics are established. Question 5 looks at the frequencies of the types of change initiatives that were undertaken. This is illustrated by

means of a histogram along with the following question which explores those individual initiatives currently being undertaken. Question 7 aims to determine the significant risks that an organisation experiences or can face during the change initiative. This is achieved by means of factor analysis using a 5 point Lickert scale.

Use of a Lickert scale in the questionnaire does not necessarily imply that the input data will be interval [99]. A rescaling is therefore required by means of correspondence analysis [100]. This is achieved as follows:

- A contingency table is established which indicates the frequency of each response per question statement.
- Use is made of the NCSS [101] correspondence analysis utility which produces a two axis solution placing the data on two interval scaled axes.
- Rescaling is achieved using the simple linear transform of $y = a + bx$.
- The transformation is applied to the original data to convert it to interval scale.

It is now possible to use descriptive analysis techniques (e.g. mean, standard deviation) to interpret the response to the question. This information is now available to be used as input into the factor analysis which aims to extricate the primary factors in the respondents opinions as being the major risk factors in undergoing a business change. Factor analysis serves three functions [102], namely:

- Minimising the number of variables while maximising the amount of information in the analysis.
- To search the data for quantitative as well as qualitative distinctions when data is large and difficulty comprehensible.
- Tests hypotheses regarding quantitative and qualitative distinctions within the data set.

Section 4 (questions 8 through 15) focuses on the organisation's approach to risk management as a facilitator in the business change process(es). Question 8 is key in that it splits the respondents into two groups by virtue of their exploitation (or lack thereof) of risk management in the analysis and execution of business change. A pie chart is used to describe the sample split as well as questions 9 and 10. Question 11 draws out the business change life cycle and aims to map onto this the current and perceived perspectives of an organisation in respect of this. This is analysed by means of a histogram and the standard descriptive statistics.

Question 12 explores the current and perceived factors in the management of risks. This is facilitated by means of a histogram. The next question explores the techniques currently being used by respondents in their risk management activities. This is achieved by means of a frequency count coupled to a 5 point Lickert scale to measure their perceived effectiveness. Factor analysis cannot be employed here as respondents are not required to answer each statement - only the valid ones. Analysis is however facilitated by means of a contingency table which provides for a weighted answer based on the Lickert rankings. This serves as a vehicle to merely prioritise the factors as perceived to be important.

The same approach is used for question 14 where causality is evaluated by making use of contingency tables. Question 15 provides for a qualitative response, the essence of which is summarised.

Section 5 deals with the respondent's opinion of risk management as an approach to securing success in business change initiatives. Question 16 and 17 as described using pie charts. Questions 18 and 19 aim to explore the key benefits and disadvantages associated with a formal risk management approach. These frequencies are described by means of histograms and their associated descriptive statistics. The next question aims to solicit opinion on whether a generic approach can indeed be employed. This is illustrated by means of a pie chart.

The last question provides the opportunity for the respondent to provide qualitative information regarding the questionnaire that can add value to the question under discussion. This is summarised accordingly.

The relationships between the research objectives, propositions and questions are shown in Table 21.

Table 21 - Link between Objectives, Propositions and Questions

No.	Research Objective	Proposition	Question
1	To investigate the nature of the different types of business change in the different industries in South Africa.	There are 6 types of changes that can be undertaken by a business to improve performance. These changes are common to all industries.	2,3,5,6
2	To investigate the nature of the risks associated with the different types of business change in the different industries in South Africa.	There are firstly, generic risks attributable to business change in general, secondly to the type of change under consideration, and thirdly, risks unique to the particular industry.	2,4,5,7
3	To determine the impact a lack of thorough risk management has on the success of business change initiatives.	Failure of business change initiatives are largely attributable to the lack of appropriate risk management.	4,8,9,17
4	To investigate the benefits and problems associated with risk management in initiating and managing change.	The perceived benefits and problems associated with risk management will reflect those described in the literature and experience.	12,18,19, 20
5	To investigate the use and demand of risk management in instituting business change.	There is a growing use of and demand for risk management in business change initiatives.	9,10,11
6	To investigate the extent of usage and sophistication of risk management methods and tools used in the activities related to the successful change of business.	Local businesses do not institute formal and sophisticated risk management practices.	13,14,15, 16,17

The approach employed to process the results is summarised in Table 22.

Table 22 - Approach to Analysing Data per Question

Question	Processing of results
1	Descriptive statistics. Is represented via a pie chart.
2	Descriptive statistics. Is represented via a pie chart.
3	Descriptive statistics. Is represented via a pie chart.
4	Descriptive statistics. Is represented via a pie chart.
5	Descriptive statistics. Is represented via a histogram.
6	Descriptive statistics. Is represented via a histogram.
7	A 5 point Lickert scale is used for (A). Factor analysis is used to develop a theoretical profile for risks from the responses.
8	Descriptive statistics. Is represented via a histogram.
9	Descriptive statistics. Is represented via a histogram.
10	Descriptive statistics. Is represented via a histogram.
11	Histogram. The relationship between current and perceived is displayed on the same chart.
12	Descriptive statistics. Is represented via a histogram. Use is made of contingency tables.
13	Descriptive statistics. Is represented via a histogram. Use is made of contingency tables.
14	Histograms. Causality is analysed using contingency tables.
15	Qualitative - information is summarised.
16	Descriptive statistics. Is represented via a pie chart.
17	Descriptive statistics. Is represented via a pie chart.
18	Descriptive statistics. Histogram. Use is made of a contingency table.
19	Descriptive statistics. Histogram. Use is made of a contingency table.
20	Descriptive statistics. Is represented via a pie chart.
21	Qualitative - information is summarised.

(f) Reliability

Reliability is concerned with the accuracy of the measuring tool, i.e. is what is intended to be measured, being measured [98]. The instrument employed in this part of the research is the questionnaire which aims to satisfy the research objectives described in Table 21. The questionnaire employs various techniques including:

- Closed-ended questions (yes, no, unsure).
- Opinion solicitation (e.g. via Lickert scales).
- Qualitative information.

In certain instances (Lickert scales) data is rescaled in order to achieve interval scale. This input provides for greater reliability in the execution of the other techniques.

The research was conducted using standard methods and measurement reliability should be acceptable.

(g) Validity

Leedy [98] lists the following six validity criteria:

- **Face validity** - Does the instrument measure what is intended? Is the sample representative of the behaviour being investigated?
- **Criterion validity** - Is there a standard against which the results of the instrument processes can be compared?
- **Content validity** - The accuracy with which an instrument measures the factors or situations being investigated.
- **Construct validity** - The degree to which the construct[1] is actually measured.
- **Internal validity** - The freedom from bias in forming conclusions in view of the data.
- **External validity** - Concerned with the generalisation of conclusions.

This research was constructed in a structured manner using scientific principles. The objectives were constructed based on the literature review and conclusions drawn from experience. Propositions were formulated pertaining to the objectives and questions constructed in order to investigate and test the propositions.

Closed-ended questions are used where possible in order to eliminate possible bias that can arise from subjectivity or questionnaire construction. The latter was further put to pilot testing which further aimed to iron out inconsistencies and provide clarity to the prospective respondents. International standards have been used where possible to assist in the validation of the results (e.g. Carr and Johannsson). Some areas are however exploratory and this is has not been possible. Use has been made of proven research techniques and methods where similar studies have been conducted have been employed where possible.

Issues concerning external validity are discussed in paragraph 3.3.3.

(h) Scope and limitations

This research is conducted into the management of risks in business change in South Africa. The literature review that seeded the research was drawn predominantly from the international arena. The "generalisability" of the results is dependent on the external validity of the study.

The database selected while constituent of large and small organisations, does not necessarily reflect the true business population. Opinions of all organisation sizes and types may therefore not necessarily be reflected. This does not however detract from the purpose of the market research, that being to extricate dominant factors on which to synthesise an integrated risk management framework.

The target persons in the organisations are the managing director or general manager functionary. The purpose behind this was to derive a holistic view. This level of functionary

[1] A construct is any concept that cannot be directly observed or isolated.

does not however necessary experience the intimate pains of business change - rather the results or lack thereof.

3.3.2 Analysis of results

This section analyses the data set comprising the 42 responses received. It serves the purpose of primary data analysis. Interpretation is however undertaken in 3.3.3. Only graphics and relevant statistics are provided here. Detailed descriptive statistics are provided in appendix J.

Statistical manipulation was facilitated by means of NCSS [101] and the Microsoft Office[1] suite of products (particularly Excel).

(a) Respondent findings

Of the 414 questionnaires mailed, 44 returned. Of these, two could not be used and were left out of the analysis. This provided for a sample size of 10.1% which satisfies the criteria described in [96]. Of the 44 returned, 33 (or 75%) provided their complete individual and organisational information.

(b) Demographic findings

(i) Number of employees in the organisation (Question 1)

The number of employees in the organisation is shown in the pie chart illustrated as Figure 26. The largest single category is organisations between 1000 and 5000 employees which amounts to 36% of the returned questionnaires.

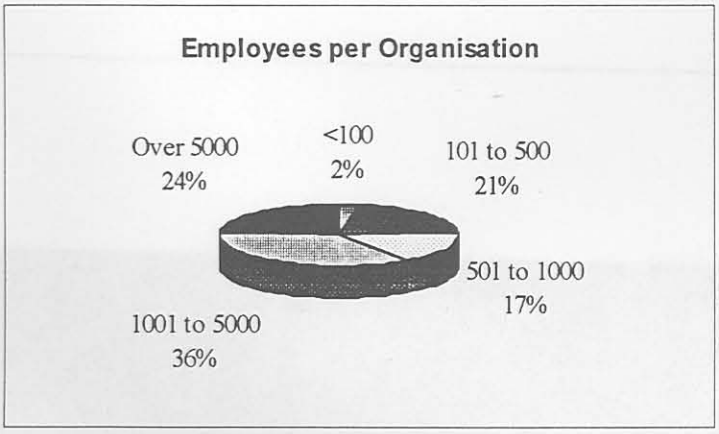


Figure 26 - Number of Employees in Organisation

(ii) Primary nature of the business (Question 2)

[1] © Microsoft Corporation, USA

A significant cross-section of industries were mailed to and provided input into the dataset. The distribution is illustrated by means of the pie chart shown in Figure 27. From the figure, manufacturing (40%) is clearly the largest sector followed by "other" (17%) and financial services (14%). Respondents in the "other" category included parcel services, tertiary education, control board, municipality, shipping, employee benefits and catering services.

In some questionnaires the respondents indicated that they were involved in various sectors. The primary sector of endeavour was however selected in these instances. This was achieved by means of a phone call or stock exchange listing descriptions.

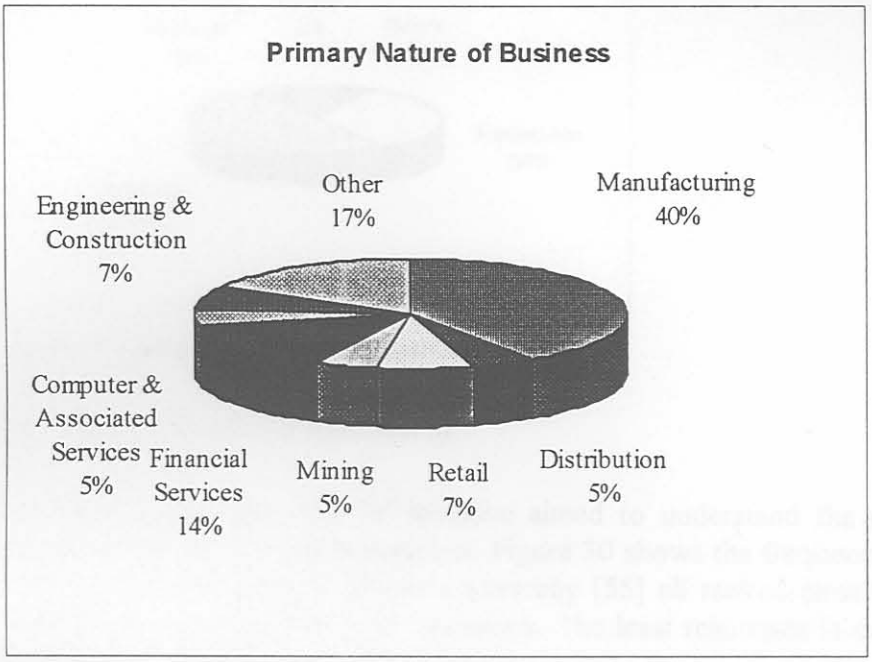


Figure 27 - Primary Nature of the Business

(c) Organisation's experience with business change findings

(i) Recentness of change initiative(s) (Question 3)

Most organisations indicated that they had completed a significant business change initiative within the last 2 years (Figure 28). The most significant frequency is in the "less than 6 months ago" interval which indicated a 34% response figure, followed by 26% and 21% for "less than 1 year" and "less than 2 years" respectively.

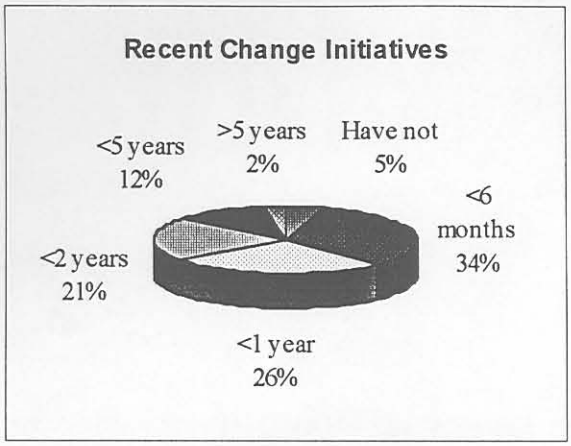


Figure 28 - Recentness of Change Initiative

(ii) Success of change initiative(s) (Question 4)

In reviewing the success of the change initiatives (Figure 29), the most significant interval indicated that the business change had been successful (49%). The next significant interval however, indicated that the results had been less than sought after (34%). Of the total, 10% of respondents believed that the change had been a resounding success while a group of similar size (7%) felt that the exercise had been a failure. None felt that they had ended up with a disaster as a result of the change.

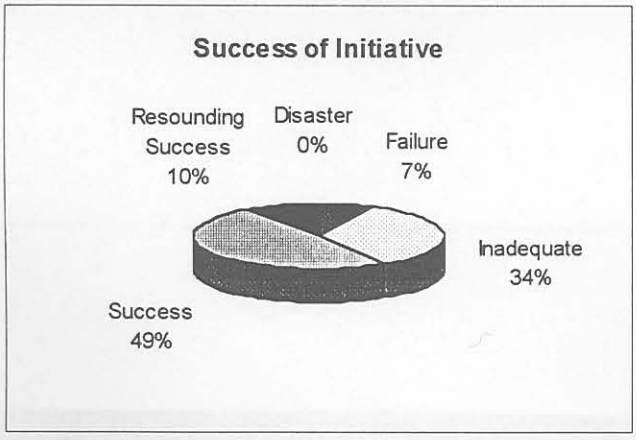


Figure 29 - Success of Change Initiative(s)

(iii) Type of initiative(s) (Question 5)

Investigation into the type of initiative aimed to understand the categorisation of change initiatives currently being undertaken. Figure 30 shows the frequency of the results. The first 5 categories according to Martin's hierarchy [55] all ranked closely, although value-stream reinvention did record the most responses. The least responses in descending order were for financial optimisation and "other". Other entailed:

- New markets and maintained existing.
- Cultural change.
- Change of account numbers.

- New technology.
- 100% growth per year.
- Cost of procurement.
- Sales.
- Relationship building.

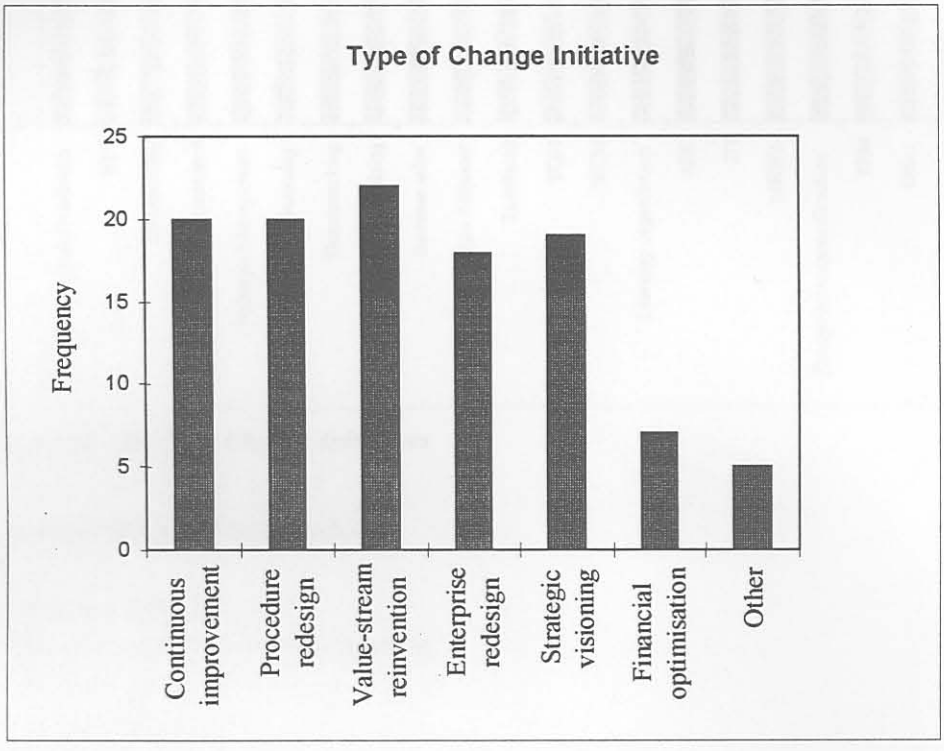


Figure 30 - Type of Change Initiative

(iv) Current initiative(s) (Question 6)

Current initiatives focused on the business change techniques currently being used by the respondent organisations. From the results (Figure 31) three groupings of the technique emerged, namely high, medium and low frequencies.

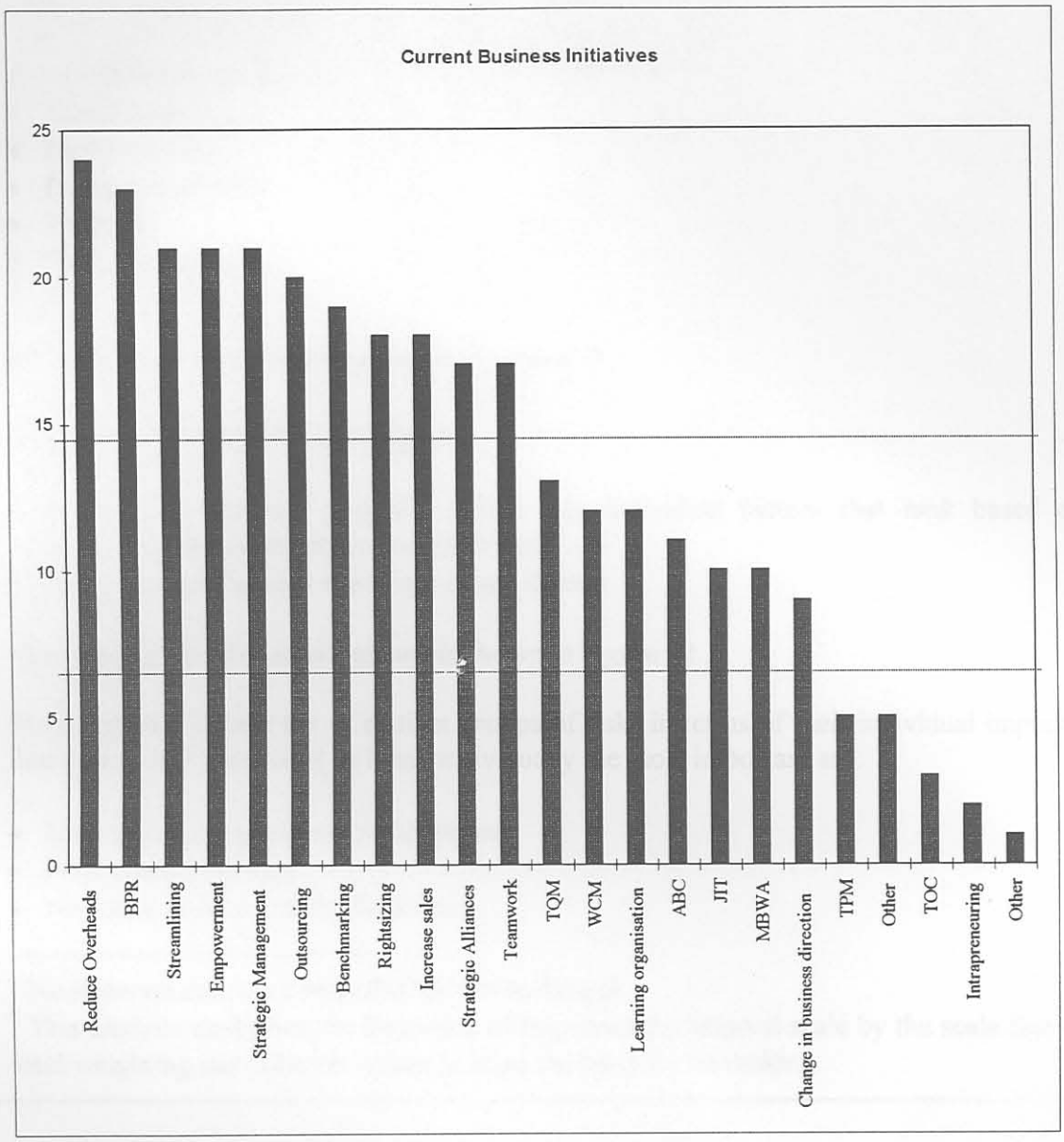


Figure 31 - Business Change Initiatives

The high frequencies included:

- Reduce overheads.
- Business process re-engineering.
- Stream-lining.
- Empowerment.
- Strategic management.
- Outsourcing.
- Benchmarking.
- Rightsizing.
- Increase sales.
- Strategic alliances.
- Teamwork.

The medium frequencies were grouped as follows:

- Total quality management.
- World class manufacturing.
- Learning organisation.
- Activity based costing.
- Just-in-time.
- Management by walking around.
- Change in business direction.

The grouping of low frequencies entailed:

- Other.
- Total productive maintenance.
- Theory of constraints.
- Intrapreneuring.
- One minute managing.[1]

Other involved:

- Concurrent engineering.
- Transformation.
- Restructuring.
- Product leadership.
- ISO9000.
- New Technologies.

(v) Risks faced during business change (Question 7)

This question is analysed in two parts:

- A weighted analysis[2] provides insight into individual factors that rank based on the respective responses (individual rankings).
- Factor analysis groups these into major themes.

The result of the individual ranking is shown in Figure 32.

From Figure 32 there are 4 distinct groups of risks in terms of their individual impacts. The first group of 7 risks rated as being individually the most important are:

- Lack of top management commitment.
- Poor communication.
- No focus on financial implications.

[1] No observations were recorded for this technique.
[2] This analysis multiplies the frequency of responses per interval scale by the scale factor. The total weighting per criterion is then used as the basis for its ranking.

- Lack of customer focus.
- Poor vision.
- Ignore employee concerns.
- Poor change management attention.

The next 8 factors grouped together in lesser importance:

- Implement without testing.
- Mis-alignment with strategy.
- Not anchoring changes in culture.
- Failure to appreciate risks.
- Not anticipating effort and energy.
- Inappropriate implementation method.
- No sense of urgency.
- Not consider holistic issues.
- Poor attention to innovation.

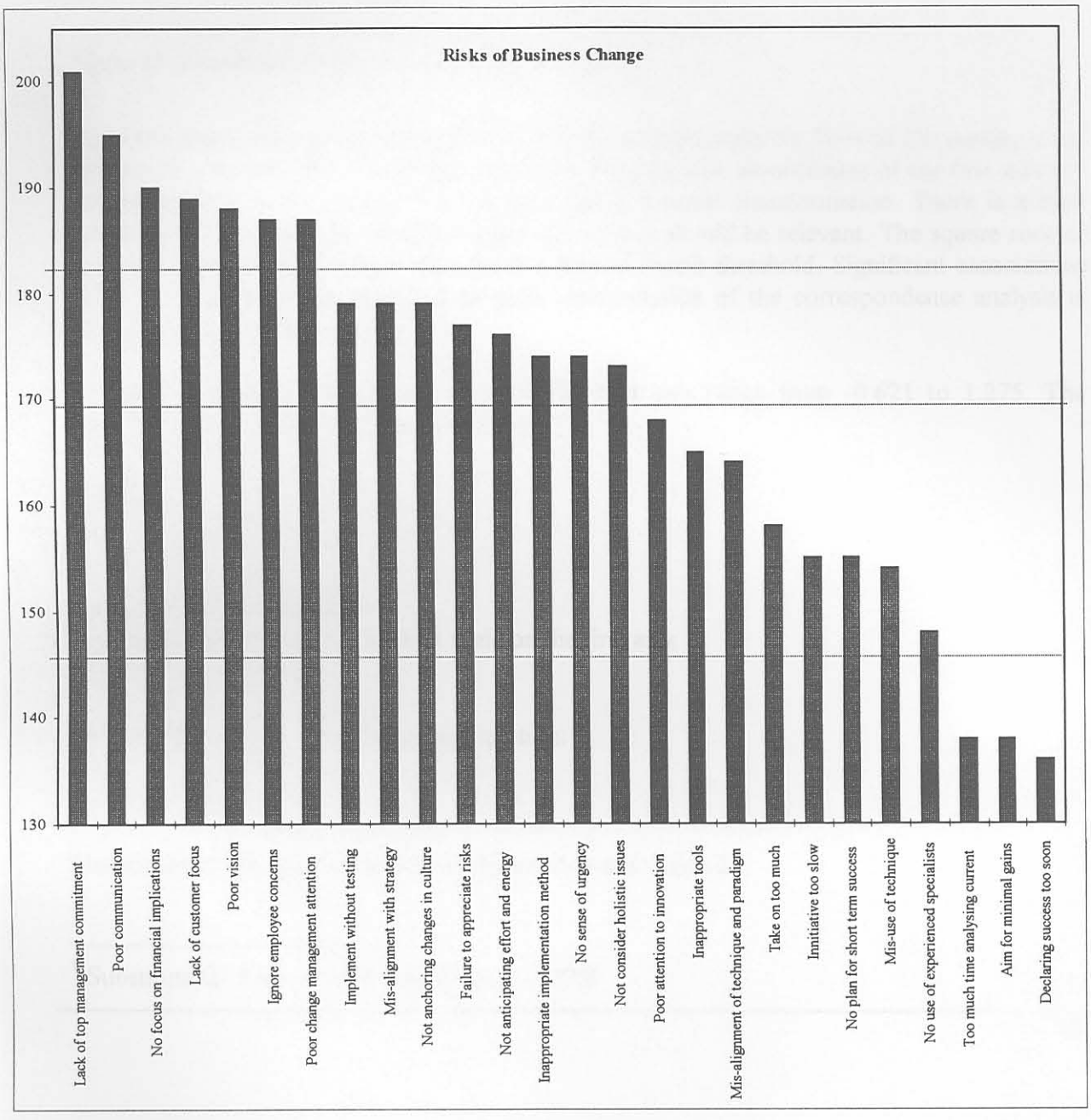


Figure 32 - Risks of Business Change (Individual Rankings)

The following three factors ranked significantly last:

- Too much time analysing current.
- Aim for minimal gains.
- Declaring success too soon.

The major themes were analysed using factor analysis. In order to use factor analysis, the data needs to be interval scale, or at least assumed to be interval scale. In this question a Lickert scale was used which under normal circumstances cannot be assumed to be interval (i.e. the difference between agree and neutral is the same as the difference between neutral and disagree). In order to proceed, rescaling is required.

The first step in the rescaling process is to establish a contingency table from the original survey data. This was done using NCSS. The results are shown as appendix K. This table is then analysed using the same tool by means of correspondence analysis. The results are included as appendix L. From Figure 33, the points exhibit the Guttman effect [99].

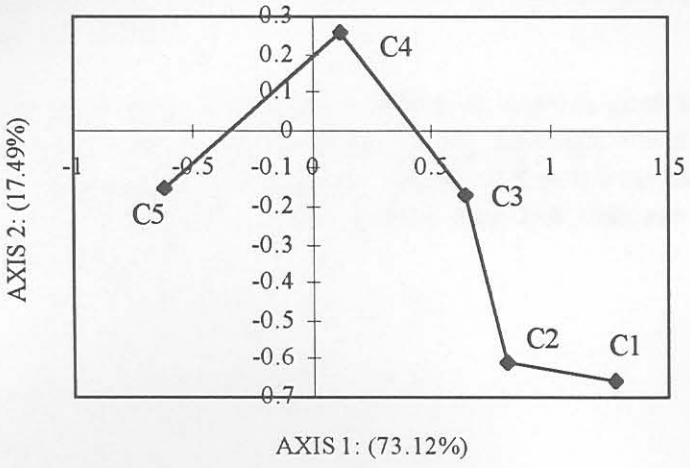


Figure 33 - French Plot of Lickert Scale Ratings

From the eigenvalue report (appendix L), the first axis accounts for 73% of the inertia, while the second accounts for 17% of the inertia. In rescaling, the co-ordinates of the first axis are converted back to an interval 5 point scale using a linear transformation. There is a high retention on the first scale which indicates this scaling should be relevant. The square root of the trace is significantly larger than the 0.2 rule of thumb threshold. Significant associations exist in the contingency table and as such, interpretation of the correspondence analysis is likely to be worthwhile.

The co-ordinates of the Lickert scale on the first axis range from -0.621 to 1.275. The rescaling is done using the linear transform:

Equation 3

$$y = a + bx$$

where a and b are constants
x is the co-ordinates of the Lickert scale on the first axis
y is the rescaled values.

Solving this[1] results in the following equation:

$$y = 3.690 - 2.110x$$

The results of the rescaled Lickert scale are shown in Table 23.

[1] Substitute ① $5 = a - 0.621b$ and ② $1 = a + 1.275b$

Table 23 - Rescaled Lickert Scale

Scale Item	Co-ordinate	Rescaled Value	Scale Difference	Original
	x	*y*		
i	1.275	1.000		1
ii	0.815	1.970	0.970	2
iii	0.644	2.331	0.361	3
iv	0.117	3.443	1.112	4
v	-0.621	5.000	1.557	5

The survey data was then modified accordingly using the transformation utility of NCSS which provides it in a form suitable for factor analysis. The descriptive statistics for this are included as appendix M.

Factor analysis was undertaken using the varimax rotation facility in NCSS. The results of this are included as appendix M. Varimax rotation is a procedure aimed at producing high loadings on some axes, with near to zero loadings on others while the new axes retain as much of the common variance as accounted for by the unrotated loading matrix [103]. This facilitates the interpretation of factor analysis results.

A four factor solution was chosen on account of the scree plot technique (as shown in Figure 34) which accounts for 48% of the total variation within the data set. The scree plot is constructed by plotting the eigenvalue of each factor against the number of the factor. The number of factors are then selected by virtue of the significant change in the slope or the "knee" as shown in Figure 34.

The four factors with the statements that load on them are listed in Table 24, Table 25, Table 26 and Table 27.

A factor loading with a value of |0.5| or more is generally seen to load heavily enough to be considered as part of the factor [104], although 0.6 is sometimes used [105]. The analysis will be based on two intervals, namely 0.4 to 0.6 to indicate a moderate contribution to the factor interpretation, while greater than 0.6 indicates a major contribution to the factor interpretation.