

Chapter 7 Accounting information on flexibility

“Judgements about flexibility options tend to be subjective and informal. Flexibility levels are rarely monitored or even measured.”
(Aaker & Mascarenhas, 1984)

7.1 Introduction

The need for organisations to be flexible in order to survive times of discontinuous change is well recorded in the literature. Kanter (1982, p.39) stresses that the organisations that are turning out to be successful now will above all be *flexible*. They will also demonstrate the ability to bring particular resources together quickly, and have the necessary capacity to deal with them. Flexibility is central to the success of an organisation in uncertain times. Information on flexibility is therefore be useful and necessary in the decision-making process of stakeholders.

The accounting model was developed during fairly stable times, and mainly for trading concerns. Since then accounting information has concentrated on a relatively small area of measurement – the financial measurement of transactions and events. If the field of Accounting is extended to include non-financial and more qualitative and forward looking information, it will develop the potential to provide information on flexibility, too. Such a system will

- support and sustain flexibility in the organisation;
- provide information on the impact of strategic, operational and administrative decisions on flexibility;
- measure and monitor flexibility levels and mixes on a continuous basis;
- provide guidance to management on changes required to flexibility levels and mixes in the light of uncertain future threats and opportunities; and finally
- provide discriminatory information which will enable stakeholders to distinguish flexible from less flexible organisations.

In its conceptual framework on reporting SAICA (1990) recognises the usefulness of information on the ability of an organisation to adapt to its environment. In paragraph 16 it is stated that the financial position of an enterprise is affected by the economic resources under its control, by its financial structure, by its liquidity and solvency and *by its ability to adapt to changes in the environment in which it operates*. Unfortunately this aspect of flexibility is ignored in the subsequent discussion in the framework and no guidance is provided to preparers and users of financial statements. Indeed, ten years earlier The Corporate Report (ICAEW, 1975, p.77) already recommended that financial reports should help users to assess economic stability and the vulnerability of the reporting entity to changes in the environment. The Stamp Report (CICA, 1980), too recognised information which allows them to assess the adaptability of the enterprise as a category of their needs. Despite this lapse of time limited work has been done on valuing flexibility and developing flexibility indicators in Accounting. Gerwin (1993, p.400) provides the following reasons for the lack of operationalisation of this construct:

- Little agreement exists as to the domain of flexibility;
- The multidimensionality of the construct compounds the effort that must go into creating scales of flexibility, testing them and collecting data;
- The construct can be studied at different levels and while measures developed at one level may apply to other levels, the collected data will not;
- Operationalisations which span industries are more useful for research than those limited to a single industry, but are more difficult to create; and
- Communication is lacking between those doing formal work with implications for measurement and those constructing scales for use in practice.

To this list other reasons for this lack of measurement may be added: Accountants are not always aware of the importance of such a construct to businesses. The accounting system has not been developed to deal with such an elusive, multidimensional construct. Accountants in general have not been trained to deal with volatility, change and flexibility, and often find it more difficult than people from other disciplines to come to terms with change (Allen, 1994). New developments in Accounting are constrained by legislation and GAAP.

It is therefore not surprising that the accounting system has to date largely failed to recognise, incorporate and measure the flexibility of organisations. Donaldson (1971, p.263) suggested that a major practical problem concerns bridging the gap between established accounting information systems geared to measuring financial values according to accepted accounting conventions and the development of flexibility measures that in effect require a new accounting system. Nonetheless, the accounting information system provides the most cost effective means of communicating information on flexibility for two reasons:

- It already has the necessary infrastructure to collect, process and disseminate information on the extended enterprise; and
- Accountants are trained to identify, measure and report on business information.

It is unlikely that the accounting system can remain unchanged by the inclusion of information on multidimensional constructs such as flexibility. There are three alternatives for the incorporation of information on flexibility in the accounting information system:

- Use of a parallel information system to record and process information on flexibility and similar qualitative constructs;
- Expansion of the existing system to accommodate both financial and non-financial information and quantitative and qualitative information; or
- Alteration of change the accounting system as a whole so that it can become better aligned to the demands for information from its clients.

A limited amount of work has been done on flexibility in Management Accounting, in the areas of discounted cash flows and net present values, the synthesis of flexibility and options theory and through the development of non-financial measures in especially manufacturing flexibility. In Financial Accounting past attempts of standard setters to require the disclosure of information on financial flexibility (only one of the categories of flexibility) have repeatedly met with vehement resistance from especially preparers of financial statements. The disclosure of information on

financial flexibility in the financial statements has been criticised as “being less than practical” and “requiring limitless disclosure that is based on speculation on the ability of a company to respond to hypothetical future events” (see Ameen in Mello, 1994, p.12). The current position is that the importance of flexibility in an organisation is recognised in Management Theory and Organisational Theory, but accounting researchers have not resolved how this important construct should be incorporated into the accounting information system of enterprises.

In this chapter the operationalisation of the construct of flexibility is considered. Attention is given to the information on flexibility that may be provided in internal and in financial and corporate reports. Suggestions are made on how this information should be measured and communicated are put forth. The categories of flexibility developed in chapter 6 are used as a basis for the measurement and communication of information on flexibility. In each of the categories, consideration is given to the scope of the category, the usefulness of such information and research developments in that area of flexibility. Each category also contains examples of flexibility measures. Suggestions are made as to which type of information and by what means the information should be communicated to users. These measurement and communication aspects form part of the implementation process highlighted in chapter 6 (figure 6.16). Lastly, the benchmarking aspect is considered briefly. In the next chapter the extent to which the construct of flexibility will assist Accounting in addressing its challenges, as developed in chapter 5, will be discussed.

7.2 Measurement and communication

Accounting is a measurement as well as a communication discipline (Belkaoui, 1992, p.25). Once transactions, events or activities have been selected by the accountant, they are measured by attaching numerals to their attributes. These measurements of elements are suitable for aggregation or for disaggregation as they are stated in financial terms (Hendriksen & Van Breda, 1992). In Accounting, measurement usually results in monetary values being allocated to objects and activities. If the object or activity cannot be measured in monetary terms, it is relegated to the notes

of financial statements and is classified as non-financial information. Non-financial information consists of quantitative information such as items measured in weight, mass and number of units or hours and qualitative information such as descriptions, opinions or discussions of certain attributes.

The FASB (1984) defines measurement in Accounting as the ability to measure relevant attributes with sufficient reliability. In other words, uncertainty as well as objectivity and verifiability act as constraints to the process. Too much uncertainty in the measurement of attributes of an object, such as an asset, results in information with a low reliability and it is accordingly not recognised in the financial statements. Similarly measurements that cannot be made objectively and that cannot be verified independently are not included in the financial statements.

Every measurement is based on a scale, whether it is a nominal, ordinal, interval or ratio (Belkaoui, 1992, p.28). In a nominal scale numbers are used as labels, such as the numbering of the ledger accounts in the accounting general ledger. An ordinal scale is used for ranking objects in respect of particular attributes, for example, one company is more flexible than another. A weakness of the ordinal scale is that differences or intervals between numbers are not necessarily equal and that the numbers do not signify how much of an attribute the object possesses (Kam, 1990, p.499). In an interval scale equal values are attached to the intervals between assigned numbers. The interval scale is used in certain aspects of cost accounting (AICPA, 1970, parr. 208-209). The ratio scale assists in the determination of the equality of ratios and has a unique original point at which the distance to at least one object is known. The ratio scale is the most often used in Accounting and usually conveys the most information. In developing a scale to measure flexibility in organisations the simpler approach would be to develop an ordinal scale, indicating which of a number of firms is the most flexible. A ratio scale would be more complex to develop, but could provide information on the extent and nature of flexibility in organisations.

When flexibility is measured in Accounting by assigning a number to an object, this number should be seen in relation to the numbers assigned to other objects. Ijiri (1967) noted that should a number be assigned to an object, it is meaningless unless

it is compared to numbers assigned to other objects and unless the relationship of these objects can be properly inferred. Accounting as a discipline of measurement in fact identifies and studies the relationships between informational elements in businesses. Similarly, information on flexibility would result in the identification of relationships. This means that a flexibility scale would serve to identify the relationship between selected numbers on the scale, and to discriminate between flexible and inflexible concerns.

In Accounting a number of measurement methods can be used to attach monetary amounts to objects and activities. The method selected should ideally be determined by the objectives of the measurement and the needs of users. For example, an object such as an asset has several attributes and the measurement and publication of some attributes using a particular measurement method may be relevant to one class of stakeholder but not necessarily to another. There are five generally accepted measurement methods:

- *Historical cost:* In this method the aggregate amount paid by the enterprise to acquire control over the use of an asset is used.
- *Current replacement cost:* Here the current sacrifice that would be incurred in the replacement of the asset is the basis for measurement (Baillie, 1985).
- *Current market value:* Current market value refers to the cash that would be paid if the same or an equivalent asset were acquired now.
- *Net realisable value:* In this method the cash that could be received by selling the asset in an orderly disposal after selling expenses is the basis for measurement.
- *Present value of future cash flows:* The present value of discounted net future cash flows that an item is expected to generate in the normal course of business.

The use of these measurement methods is a contentious issue in Accounting that is far from resolved. The conceptual frameworks of the FASB, the IASC and SAICA do not prescribe a measurement model, but merely list and describe the alternatives models. The most widely used model remains the historical cost model, and the

hybrid historical cost model, which incorporates the revaluation of assets. There is however a discernible movement towards the use of current market values to measure instruments such as derivatives and investments. This debate on measurement bases complicates the development of flexibility measures. If a monetary value is attached to a certain type of flexibility, which measurement model is the most appropriate? Not only is there little consensus on an appropriate measurement basis, but the majority of models are based on arm's length transactions (for example the buying, selling or replacing of assets) which may not apply to an intangible, non-separable, internally generated and pervasive construct such as flexibility.

The main benefit of financial information in Accounting is that it allows stakeholders to aggregate, disaggregate, interpret and compare information. Interpretations take place by relating the performance of the firm to a benchmark, be it the previous year's results, competitors' performance or industry indicators. These interpretations result in recognition of trends, acceleration, change, direction, speed, interactions relationships and patterns which, although often based on historical information, have feedback and some degree of predictive value to users.

The construct of flexibility should be measured and monitored. Its measurement will enable stakeholders to assess the organisation's vulnerability to environmental volatility. Donaldson (1971, p.278) contends that the measurement of flexibility is an attempt to measure, as well as possible, the economic muscle of the business either for seizing opportunity or for coping with adversity. Gerwin (1993) suggests that researchers need flexibility measures to test theories and managers need them to reach decisions, on for example investments or to determine performance levels. He submits the operationalisation (or measurement) of flexibility is the *single most important research priority* in this field of study. Once the construct has been measured it should be monitored by management to ensure that flexibility is maintained.

When measuring flexibility or developing a scale of flexibility, there are two distinct aspects to consider. The *first* aspect is the valuation of flexibility itself. Placing a value on flexibility is often somewhat of a paradox. To illustrate, flexibility is an

attribute which management can cultivate in organisations so that they can respond to uncertainty. The further one looks into the future, the greater the uncertainty and the more unstable and unpredictable the environment becomes. The value of flexibility arises from this uncertainty. However, uncertainty does, however, not lend itself to neat quantification or description, required of a variable in valuation models. The more one attempts to quantify uncertainty, the more it loses some of its attributes. A similar logic applies to flexibility. This means that when one attempts to value flexibility, it loses some of its attributes.

The opposite view is that if flexibility is not measured, it cannot become and remain visible and cannot be monitored by management. Peters (1991) comments that what gets measured get done. Placing a value on flexibility will often require the use of surrogate variables, in other words variables, which the management and accountant identify as being indicators of the different levels and types of flexibility in the firm. Flexibility indicators do not have to determine the value of a concept which is so difficult to measure precisely, but should instead serve to identify broad trends (Gerwin, 1993). So, for example, one of the most common surrogate measures in practice consists of counting the number of options available to management at a given point in time.

Several researchers use options theory to attach a value to flexibility (Triantis & Hodder, 1990; McDonald & Siegel, 1985; Trigeorgis, 1993; Muralidhar, 1992). They argue that the value of flexibility arises from the ability of management to defer decisions, expand or shut down operations, and so forth. (see figure 6.4). A limitation of the options theory approach is that flexibility is deemed to arise only from the number of strategic options available to management. Other aspects of flexibility such as the ability to innovate, create, recognise opportunity, anticipate threats or influence the environment, are not included. Kumar (1987) suggests entropy as a basis for measuring flexibility, in that the freedom of choice of management in using options should be considered. Entropy has intuitive appeal as it mirrors the randomness or uncertainty in the system (Gerwin, 1993).

Another valuation alternative is to use economic value as a basis. The present value of future cash flows including the flexibility of the company could be compared to the

present value of future cash flows excluding flexibility, with the difference between the two providing an indication of the value of flexibility at a point in time. This alternative has serious limitations, as forecasting future cash flows both inclusive and exclusive of flexibility may be difficult and unreliable. A variation on this approach may be to incorporate flexibility into the cost of capital instead of the future cash flows. The determination of the amount by which the cost of capital should be adjusted to incorporate flexibility remains a problem however. Furthermore, in very volatile times the value of flexibility as determined by means of this approach may even be negative. In such periods flexibility provides the means of survival to the organisation, even at the cost of profitability and cash flows over the shorter term. If the entity is listed, another alternative may be to consider market capitalisation as a means of valuation. The listed share price and the number of issued shares provide the market capitalisation from which net assets valued at market value is deducted to provide goodwill. The value of flexibility in the organisation then forms part of the goodwill.

A more qualitative approach to valuing flexibility is suggested by other researchers. Gerwin and Tarondeau (1989) use a five-point scale from “flexibility has decreased a lot” to “it has increased a lot” to assess management’s perceptions on flexibility. Volberda (1998, p.236) proposes a scale from 0% to 100% to measure the flexible capabilities of management. The use of such opinion polls and perceptions are, however, subject to biases, which are certain to distort responses. Another approach to valuing flexibility may be to select appropriate attributes of flexibility and to use statistical models such as multicriteria decision making to establish a value (Bogetoft & Pruzan, 1991).

The limitations in valuing the construct flexibility is that valuation models tend to place a value on the construct at a particular point in time, while the creation or where applicable destruction of flexibility is a continuous process and its value can fluctuate significantly in response to environmental change. Many of the models proposed in the literature are difficult to use or rely on variables, which are difficult to identify. Nonetheless, the valuation of flexibility at a point in time is useful if completed for special purposes such as mergers and take-overs, competitive benchmarking, strategic positioning and share listings.

The *second* aspect to valuing flexibility is to develop flexibility measures and indicators. These may be measured in monetary units, physical units or qualitative means. The indicators can be used to measure the required, actual and potential flexibility in the production, marketing, financial, informational, geographical and human, cultural and organisational categories from a cost, time, quality and range perspective. From the experimentation, development and monitoring process carried out by the management of companies to develop indicators of flexibility, some may emerge as good indicators and measures of flexibility (see figure 6.16). These may then be collected and used to build scales of flexibility. Such scales will allow managers and researchers to compare levels and types of flexibility of organisations to those of their competitors and their industries. In this thesis the evolutionary development of flexibility measures in enterprises, which can be communicated by means of the accounting information system, is developed. Consequently, this chapter concentrates on describing and providing examples to management and accountants of indicators and measures that may be surrogates for measuring flexibility in each of the six categories developed in chapter 6.

Accounting is not only concerned with measurement, but also with the communication of information to users (Belkaoui, 1992; Chambers, 1995). Communication is a broader concept than the mere reporting, distribution or disclosure of information. It is an issue seldom addressed in accounting textbooks – they tend to focus on technical aspects and the content of financial reports rather than on the problems associated with the communication of the information. Gouws (1997, p.75) adapted the ideas of Dance (1970, pp.201-210) from Communication Theory to identify the following 14 components of the accounting communication process:

- Accounting communication entails the verbal interchange of financial messages through symbols.
- Accounting communication is a process by which accountants understand users and in turn endeavour to be understood by them.

- It is dynamic and changes constantly in response to the demands of an ever-changing environment.
- Accounting communication involves interaction between stakeholders.
- Accounting communication grows out of the need to
 - reduce uncertainty;
 - act effectively and economically; and
 - defend or strengthen perceptions or states of affairs.
- It is the process of transmitting data, information, ideas, trust, etc., by means of words, symbols, graphs, etc.
- Accounting communication acquires a sense of participation between the sender and the receiver of the message. Something is transferred from one to the other.
- It is the process by which the particular character of the accountant and the users are linked to each other.
- It is a public rather than a private process. Certain sectors or persons should not be favoured to the detriment of other sectors or persons.
- Accounting communication is the carrier of economical and financial messages, or the channel through which messages flow from the preparer to the user.
- Accounting communication also embodies the discriminatory response of a user to the stimulus contained in messages.
- It consists of a sequence of discriminatory stimuli from the preparer to the user.
- Its main purpose is to affect the behaviour of the user/reader by means of economic and financial messages.
- Accounting communication is the process whereby power is exerted in an uncertain world, which results in movements of wealth.

The communication of information on flexibility by the accountant to users of information encompasses far more than designing indicators on aspects such as flexibility and distributing the information to interested parties. Communication is a process that empowers the receiver of information. The accountant is an active party in the communication process, who contributes to the decoding and interpretation of

information. The type of information that is communicated to the users is determined by and developed around the needs of the users. These needs are constantly changing and evolving. The close relationship between the accountant and users of information required in a communication process is maintained by continuous interaction and feedback. The feedback serves to enhance the quality of the information on a continuous basis, and to align the information to the needs of users.

The communication of accounting information on flexibility seems less of a problem to internal users, such as management and employees. They can demand the information even if the accounting information system is not geared to provide the type they require. However, the cost of the information may as a result, be relatively high. Their access to the accountant allows them to involve him/her in the decoding and interpretation of the information. On the other hand, because external users rely on external sources of information to a greater extent, they tend to base their decision making on a broader base of information.

External users will experience more problems in gathering information that is not explicitly disclosed in financial reports in compliance to legislation and standards. Information on flexibility can however be reported to external users in the financial reports as part of the notes to the financial statements. In support of this approach, the IASC (1995) recognises the notes and other statements and explanatory material as forming an integral part of the financial statements and states that these assist in meeting the objectives of business reporting. In the light of this, Koornhof (1988) suggests that preparers should present the information outside the financial statements in the form of summary tables, which highlight, with comparatives, actual flexibility indicators and targets set by management. The information on flexibility can also be included in segmental and cash flow reporting.

An alternative approach would entail the incorporation of the construct of flexibility into the accounting system and thus into the main financial statements – the balance sheet, income statement, statement of changes in equity and statement of changes in financial position. Such an approach will require extensive change to the existing accounting model as the system is not designed to deal with non-financial

information, change, a future and open system orientation and with multidimensional, pervasive constructs such as flexibility.

If the financial reports are not used as the only means of communicating with these stakeholders, electronic media such as controlled access to the organisation's information data base could be used to communicate this type of information instead. The benefit of technology is that the stakeholders can access up to date information at the level of detail required, and do not have to wait for the release of the financial reports.

The above suggestions only address the reporting and disclosure of flexibility information to users. The communication of information on flexibility requires a higher level of interaction between the accountant and these users than presently exists. The communication task of the accountant should not be limited to decoding, interpretation and feedback but should include the education of these users in the benefits and uses of information on flexibility. The communication process may then be used as the vehicle for providing, decoding and interpreting signals and for educating the users.

In this chapter the broader concept of the communication of information on flexibility is not addressed. This area requires further research, not only in relation to information on flexibility but also in respect to all types of information. As a result, the next section deals with the "reporting" rather than the "communication" of information on flexibility.

7.3 Measuring and reporting information on flexibility

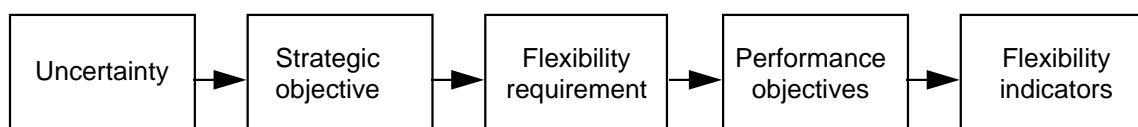
Flexibility arises from a formal decision problem in which the choices from future options are affected by the choices made now (Gerwin, 1993). In other words, the decisions on flexibility made in the present impacts on the options management will have available in the future in response to unforeseeable change. Flexibility is future oriented and the future is unknowable (Stacey, 1992a) and therefore particular problems arise in the measurement and reporting of this type of information.

Because of the nature of the construct, analytical models are proposed which are often difficult to solve unless restrictive assumptions are made (Gerwin, 1993), which in turn result in the exclusion of some of the attributes of flexibility. This supports a prior argument that once flexibility is measured, it loses some of its attributes. With these restrictions in mind the six categories developed for flexibility in the previous chapter (production, marketing, financial, informational, geographical, human, cultural and organisational flexibility) are used as a framework within which information on flexibility can be developed. The use of these categories, essentially a form of reductionism, is warranted as it provides a viable means of exploring the complex aspects of this multidimensional construct in the organisation.

The creation of these categories should however not be used in a manner which fragments the construct. Flexibility is a pervasive quality in enterprises, which is best understood and managed if viewed from a holistic perspective. The procedures for measuring and reporting on flexibility, described later in section 7.4, are designed so that flexibility is initially viewed as a whole, before it is analysed further in terms of the six categories of the framework.

The proposed categories are designed to serve as tools to management and accountants in translating their flexibility requirements into performance objectives and finally into flexibility indicators. Gerwin (1993) suggests that management follows a number of procedures in developing flexibility indicators. They should commence by translating the particular type of uncertainty with which they are dealing into strategic objectives that in turn determine certain flexibility requirements. These flexibility requirements are then translated into performance objectives that can be measured through flexibility indicators. These procedures, with examples applicable to the production category, are illustrated in figure 7.1. Management can adopt similar procedures to develop flexibility indicators in each of the other five categories.

Figure 7.1 : Development of flexibility indicators



Example:

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Market acceptance of kinds of products	Diverse product lines	Mix flexibility	<ul style="list-style-type: none"> • Range of products • Fast setup time • Manufacturing lead time 	<ul style="list-style-type: none"> • Number of products • Number of variations • Setup time in hours • Lead time of products in days
Length of product lifecycles	Product innovation	Changeover flexibility	<ul style="list-style-type: none"> • Lead time in introducing new products • Design of products 	<ul style="list-style-type: none"> • Days from research to manufacturing • Number of design variations • Number of parts used • Number of sub-assemblies • Number of new products introduced

Source: Adapted from Gerwin, D. (1993) Manufacturing flexibility: a strategic perspective, *Management Science*, vol.39, no.4, p.398.

As is clear from the above figure, uncertainty arises as a result of an inability to understand complex relationships so as to predict the future or control the environment. In developing these flexibility indicators, management and accountants can use the classification framework proposed for flexibility in figure 6.7. Each category of flexibility for which indicators are developed has a required level of flexibility. This level is obtained by screening the environment, an actual level of flexibility which is obtained by analysing the conditions and capabilities in the firm and a potential level of flexibility which is not currently being utilised or which may be created almost immediately and at a low cost. The required level of flexibility serves as the benchmark with which the actual and potential flexibility may be compared to identify areas in the firm where flexibility should be created. In each of the six categories the firm gains competitive advantage through flexibility by outperforming competitors on the four strategic aspects of quality, cost, time and range. These strategic aspects are used to determine the type of flexibility indicators that are developed.

From the above description it is apparent that large numbers of flexibility indicators can be developed. Organisations should however limit the number, keep the calculations simple and make the indicators visible to employees (Peters, 1991). This will ensure that the selected indicators will direct and influence decisions and actions in the organisation instead of resulting in information overload, inertia and finally, inflexibility.

The core competencies of organisations developed by Prahalad and Hamel (1990) may provide a feasible basis for selecting the most appropriate indicators for a particular organisation. Core competencies are the collective learning in organisations, coupled with the ability to co-ordinate diverse production skills and integrate multiple streams of technology (p.82). Wheatley (1994, p.93) noted that a business that focuses on its core competencies, identifies itself as a portfolio of skills rather than a portfolio of business units. Such a business can respond quickly to new opportunities because it is not constrained by the rigid boundaries of products and business units. It rather concentrates on the strength arising from human capabilities. The core competencies give organisations a competitive advantage by providing potential access to a variety of markets, by meeting and exceeding perceived customer benefits in end products and by providing a competence, which is difficult for competitors to replicate or imitate. It is important that firms should focus on the areas where they can surprise, outperform and outmanoeuvre competitors rather than merely attempting to replicate that which competitors already perform. Flexibility indicators should therefore be selected to support the organisation's core competencies, as these will be its unique sources of competitive advantage.

The measurement and reporting of flexibility indicators pertaining to each of the six categories of flexibility will now be explained in more depth. The sections consist of a description of the *scope* of the category, together with a number of *examples* to illustrate the role of flexibility and the key *indicators* and *measures* that may be used in each category. A brief overview is provided of the *research* on the measurement and reporting of flexibility in each category.

7.3.1 Production flexibility

Production flexibility refers to the flexibility that an organisation obtains through its selection of and relationships with suppliers, its manufacturing process and total quality management and through its customer relations. Kulatilaka and Marks (1988) note that it is a well-known fact that one of the most significant advantages of flexibility is that it provides the production process with an ability to modify itself in the face of uncertainty. This type of flexibility is achieved by continuously eliminating constraints in production that cause delay, waste, variation, excess, additional work, subquality products and poor customer service. An organisation with high production flexibility typically gains competitive advantage by supplying customised, personalised, innovative, high quality goods and services faster, cheaper and more efficiently to customers than any of its competitors.

Production flexibility consists of three main components, namely input, processing and output as illustrated in figure 6.8. Kulatilaka (1993) presents a simple example of flexibility in the processing section, which arises from the option value of switching between different machines. He uses the model to evaluate the incremental cost savings of a dual fuel boiler over two single fuel boilers and found that the value of flexibility exceeds the incremental investment cost of purchasing a dual fuel boiler. The flexibility thus arises because it gives management the option of switching between different modes of operation. If oil or gas prices change, for example, the flexibility allows it to select the lower cost fuel source while keeping switching costs to a minimum. The value of this type of flexibility increases as fuel prices become unstable.

Some years earlier, Kulatilaka and Marks (1988) described production flexibility as *the ability to change a process from one mode of operation to another*. Manufacturing plants are for example able to choose between purchased electricity, co-generated electricity and natural gas, or between labour intensive and capital intensive technologies. They illustrate production flexibility and its link to strategic choice by means of a wage bargaining example. Wages form part of the input component of production flexibility:

“Consider two scenarios. In scenario 1 there is fixed technology in place that uses one unit of labour. The firm and the labour union

bargain over the pre-wage surplus, R . In scenario 2 the firm has a flexible technology in place with two modes. The first mode is identical to the fixed technology of scenario 1. The second mode uses less labour. Suppose that it is profitable to switch to the second mode if wage is high. That is, the firm now has a threat that says to labour, "if you demand too high wages, we will employ fewer workers". Let us suppose that this flexibility is costless to install and that switching between modes is also costless. Finally, suppose that there is no uncertainty regarding the production process future prices, or bargaining outcome. It is well established that such flexibility confers strategic advantage on the firm resulting in a lower input price."

(Kulatilaka & Marks, 1988, p.575)

It is apparent from the example that production flexibility arises from uncompleted contracts or contingent contracts, which have undetermined variables that may be sources of flexibility. If all aspects of a contract are known and fixed as is the case in a completed contract, no strategic flexibility value is possible. In the above example, once agreement is reached in the wage bargaining as to the value of R and the outcome is favourable to the firm, the strategic option becomes less attractive until the next round of wage bargaining takes place. The strategic value of contingent contracts arises typically because the firm has the option to exercise, renew, defer or abandon it. In terms of options theory, the uncertainty and volatility present in a contingent contract confers strategic value to the organisation. Contingent contracts are examples of potential flexibility, and the value of flexibility of this nature can be measured by means of options theory.

Production flexibility (or sometimes called manufacturing flexibility) is the most comprehensively researched of the six categories. Some research has been done in Management Accounting on the use and disclosure of production flexibility information. Kaplan (1983) suggests that accounting researchers should attempt to develop non-financial measures of manufacturing performance such as productivity, quality, inventory, product leadership, *manufacturing flexibility* and delivery performance. A number of research studies in Management Accounting concentrated on the development of non-financial measures, which can be used to measure production flexibility. A structured approach to developing non-financial indicators, a "balanced scorecard approach", is proposed by Kaplan and Norton (1993). The balanced scorecard approach is a strategic measurement system that supports and motivates breakthrough improvements in identified key areas of the organisation such as product, process, customer and market development. The measurements

are derived from the strategy adopted by the organisation and are focused on the environment of the organisation.

This development of non-financial measures has focused mainly on the informational needs of management, with only limited information being communicated to external users. Kaplan and Norton (1993) contend that the balanced scorecard approach is not suitable for reporting to external users as it focuses on SBUs, which cannot be aggregated into an overall corporate scorecard. They note further that even if the scorecard itself was adjusted to accommodate external reporting, the financial community at present shows little interest in making the change from financial to strategic reporting. Users of financial information have, however, indicated that they require more operating data and performance measures that are used by management to manage the business (AICPA, 1994a, p.28).

A well researched area of flexibility is DCFs. Early critics such as Dean (1951), Hayes and Abernethy (1980) and Hayes and Garvin (1982) recognised that DCF criteria often undervalued investment opportunities. This often leads to myopic decisions, underinvestment and eventual loss of competitive position, because they either ignored or did not properly value important strategic considerations. The development of options theory provided a suitable vehicle for measuring the impact of management flexibility on such investment decisions. Trigeorgis and Mason (1987) view management flexibility as the ability to adapt management's future actions in response to altered future market conditions. This flexibility expands an investment opportunity's value by improving its upside potential, while limiting downside losses relative to management's initial expectations under passive management. The DCF models which incorporated flexibility focused not only on production and marketing flexibility, but also the financial flexibility which stems from financial leverage (Trigeorgis, 1993). It is therefore also relevant to the next two categories of flexibility, namely marketing and financial flexibility.

In another area of research the implications of manufacturing flexibility on the use of efficiency-based performance measurement systems and the use of integrative liaison devices such as teams, task forces and spontaneous contracts were examined. In their study Abernethy and Lillis (1995) indicate that the role of

Accounting or other efficiency-based performance measures decline in those firms with a commitment to manufacturing flexibility. This implies that in firms whose aim is to increase manufacturing flexibility, the role of accounting information is likely to decline especially if it continues to focus on purely prescriptive financial performance measures. This supports the view that the accounting system will have to evolve from a rigid, closed system approach to a flexible open system approach, which lends itself to the measurement and monitoring of qualities such as flexibility.

In their research, Parthasarthy and Sethi (1993) analysed different strategy and structure choices in 87 firms that make use of flexible automation. They found that quality and flexibility strategies complemented the flexible automation strengths, while strategies such as low cost interacted negatively with flexible automation. In their study flexibility was divided into scope flexibility and changeover flexibility. The former involves competing on product variety and volume flexibility and the latter on frequent new product introductions, and on speed in innovation.

A number of flexibility indicators can be developed to measure production flexibility. According to Schonberger (1990) companies such as Motorola and Westinghouse use product lead time as a dominant measure of performance. As was illustrated in figure 7.1, lead time can also be used to measure production flexibility. If manufactured product lead times are shorter than those of competitors, the firm is able to respond more quickly to changes in the markets. Added benefits to a drop in lead times include reductions in use of space, costs and waste. Consider the case where a competitor threatens the current position of an organisation by introducing a superior product to the markets. If the organisation has the correct production flexibility mix, it can respond by introducing a competing product. If production flexibility is achieved through lead times, the time required to benchmark, innovate, design, develop and produce will be shorter than those of competitors and the company can counter the threat by putting an improved product on the market. Where production flexibility is achieved through product design, the existing product could be altered sufficiently to produce a differentiated or customised product or one with alternative uses. Production flexibility from a change of machinery may allow new products to be manufactured on existing production lines, so that no additional capital investment is required. Other strategic alternatives, which may be facilitated

through production flexibility, may entail changing product lines or lowering the costs of the existing products. The greater the range of feasible production flexibility options available to management in response to a threat such as the one described above, the greater the organisation's production flexibility and the probability that a timely, cost effective option which maintains quality requirements can be found to avert the threat.

The accounting information system can support the aim of management to achieve production flexibility. Johnson (1992, p.104) contends that companies require new management information about customer expectations and the flexibility of processes in order to reinforce actions that fulfil the imperatives of global competition, and of being responsive and flexible. Information on production flexibility is useful to management in sustaining and measuring actual and potential levels of production flexibility, considering the impact of their decisions on future levels, and establishing the required levels to deal with unexpected change. Information on production flexibility is thus important to management. In view of the fact that it is used to run the business and position it relative to competitors, it will also be useful, and should be communicated, to external users. Furthermore information on the level of production flexibility of an organisation provides an indication of its probability of surviving in times of dynamic change.

The means of gaining production flexibility will differ from firm to firm. Each firm will select a number of key indicators to measure their progress in critical performance areas with regard to production flexibility. If the aim of a firm is to gain competitive advantage through quality, measures such as defect rates, response time and delivery commitments can be used to evaluate the performance of their products, services and operations against those of competitors predetermined goals and past performance (Eccles, 1991). In the case of a customer-centred firm, performance can be evaluated in terms of data collected directly from customers, such as customer retention rates, market share and perceived value of goods and services (Eccles, 1991). A measure of successful relationship building with customers may be the share of revenue from sales to old customers compared to sales to first-time customers (Johnson, 1992, p.108). If the organisation has material flexibility, indicators such as the number of alternative suppliers and the different types of

materials can be used. To measure modification flexibility, the number of available design changes can serve as an appropriate indicator. For rerouting flexibility, the number could be indicated by alternatives routes through the production line. According to Johnson (1992, p.108) the following ratios promote flexibility:

- *Total time/necessary time*: Actual time spent on a task (including delays) in relation to the ideal time that should be spent on it.
- *Use rate/demand rate*: The relationship between processes and the final demand rate.
- *Number of pieces per workstation*: A comparison of the actual number of work in process items to the required number.

Turney and Anderson (1989) suggest measures that generally lead to continuous improvement in manufacturing performance and which may also be used to measure production flexibility:

- *Output rate*: A measure of total process efficiency;
- *Output per person*: The cost of output achieved per person per day;
- *Output per salary dollar*: The output based on both direct and indirect salaries;
- *Cost of sales ratio*: The cost of sales to gross sales as a measure of productivity relative to the market value of output;
- *Floor space*: A measure of the ability to limit inventory levels and improve production flow; and
- *Cycle time*: The elapsed time from the start of instrument assembly to completion.

Aaker and Mascarenhas (1984) suggest that production flexibility arises from investments in underutilised resources or reduction in the commitments for the specialised use of resources. In the first case production flexibility may be measured by the ratio of excess capacity to total capacity, or by analysing and describing the multipurpose capabilities of equipment. The second type of flexibility may be measured in terms of the number of temporary workers and the suppliers used, the extent of outsourcing, and the number of available distribution channels. Gerwin

(1993) regards the extent of unused floorspace and slack time in the production schedule as indicators of volume flexibility, while the permutations available in production lines and scheduling are regarded as indicators of rerouting flexibility.

As was mentioned previously, the selected measures should be appropriate to the strategies, critical performance areas and core competencies of the firm and may not be comparable to those of other firms. Furthermore the measures often have a non-financial rather than a financial nature. The indicators should therefore be kept simple and be limited to prevent information overload. The indicators selected should support strategies of the firm by focusing on the areas of strengths which may enable it to gain production flexibility by doing something faster, better, with greater variety and more cost efficiently than its competitors.

7.3.2 Marketing flexibility

Marketing flexibility refers to the ability of an organisation to enter and leave markets and to reposition itself within existing and new markets. This flexibility is also created by the ability of an organisation to switch its marketing strategy quickly and effectively between cost leadership, differentiation, focusing or a combination of these. The firm with high marketing flexibility gains competitive advantage through its ability to change, restructure and reposition itself in world markets at a quicker rate and more successfully than its competitors. Marketing flexibility is also created by participating in multiple markets (Aaker & Mascarenhas, 1984) and being able to switch between these markets. As a result, management is able to choose from a number of feasible options, allowing them to change their marketing strategy and position rapidly and efficiently in the face of opportunities to be exploited or threats to be averted.

The competitive advantage derived from marketing flexibility is achieved by knowing your competitors and surprising, outperforming and outmanoeuvring them. CIMA, (1997, p.77) confirms that competitive advantage is relative – it is only possible if you have competitors. The identification and study of competitors and potential competitors are therefore of prime importance for the creation marketing flexibility. Boynton and Victor (1991) note that a firm's competitors are no longer defined solely on a product basis. Competitors are all the companies that have the capacity to re-

configure to produce related products and enter related markets, even if they are not currently doing so. A marketing flexible company will know its own capabilities and its core competencies through which competitive advantage may arise.

Extensive work has been done especially in marketing to identify and assess the position of a firm relative to its market. Porter (1980, pp.47,49) states that competitive strategy involves positioning a business to maximise the value of the capabilities that distinguish it from its competitors. Again, an important aspect of strategy formulation is competitor analysis. Porter distinguishes five components of such analysis:

- Studying the future goals and current performance of competitors;
- Identifying the assumptions and beliefs held by competitors about their relative position in markets;
- Analysing the strengths and weaknesses of the firm's current strategy;
- Analysing the competitors' core competencies;
- Establishing how satisfied competitors are with their current market position and the probability that they will move or change strategy.

This implies that the information system should gather information outside the company about competitors and markets. The organisation and its information system should be open systems that interact proactively and reactively with its environment.

The next level of competitive analysis usually takes place on an industry level. Three key dimensions about industries should be considered here (Porter, 1980, p.189):

- *Industry concentration:* The market may be well concentrated or fragmented. A firm cannot strongly influence the industry outcome in a fragmented industry. A perceptual map of the market positioning is a tool that can be used to identify gaps existing in the market of a typically fragmented industry (CIMA, 1997, p.416). Companies in concentrated markets may not require the same level of marketing flexibility than companies in a fragmented market where there are higher levels of uncertainty and potential volatility.

- *State of industry maturity:* An industry may be emerging, maturing or declining. Marketing strategy and flexibility are affected by the maturity of the industry. An emerging industry is highly volatile as there are no “game rules”. Typically competitors are unpredictable and the industry is attractive to new entrants because of its growth potential. A presence in an emerging market requires more marketing flexibility than a presence in a mature industry.
- *Exposure to international competition:* As a result of the globalisation of markets and the creation of economic blocks, few markets have remained purely local. In analysing markets, both national and international competitors and potential competitors should be taken into consideration. A firm dealing with international competition requires higher levels of marketing flexibility as well as flexibility derived from geographical positioning (category five of the framework of flexibility types).

Competitor, industry and competency analyses *support* marketing flexibility, but do not *create* it. Marketing flexibility is created by the management of the firm and combines an awareness of the benefits of flexibility with willingness and ability to identify feasible options to choose from and to act quickly and decisively in response to competitive change. The greater the volatility and uncertainty in the industry and markets, the greater the value attached to marketing flexibility. Marketing flexibility is therefore a construct, which discriminates between companies' levels of adaptability and responsiveness in markets. A firm with a high marketing flexibility will be able to overcome mobility barriers in markets faster and more efficiently than its competitors. Marketing flexibility tends to lower the risk of the firm and thus increases its economic value.

The following example will illustrate marketing flexibility: Assume that two identical firms A and B are both differentiators in a market with one cost leader. The only distinction between the two is that firm A has a high level of marketing flexibility and firm B a low level. If an opportunity arises in the market, such as the exit of the cost leader, and the assumption is made that the competitive strategy of A and of B is to take over the cost leadership, it is hypothesised that it is more probable that A will be successful in taking over the cost leadership than B as it has more strategic options

to choose from, coupled with a greater ability to act quickly and cost effectively in seizing new marketing opportunities. It follows that in valuing firm A and B, a greater value should be attached to the former because of its marketing flexibility.

Harrigan (1985, p.1) recognises the existence of marketing flexibility, although she uses the term “strategic flexibility”. She defines strategic flexibility as a firm’s ability to reposition itself in a market, change game plans, or dismantle current strategies when the customers it serves are no longer as attractive as they previously were. Unfortunately organisations often ignore the issue of strategic flexibility or marketing flexibility in their competitive strategies. These firms become inert, rigid and remain in the same strategic positions in markets. Such positions often become progressively obsolete in times of rapid change.

Information on marketing flexibility should of necessity focus externally on the environment, on its existing and future customers, on market segments and target markets and on its existing and potential future industries. This type of information is useful to management in decisions on positioning the firm within global markets. Marketing flexibility information provides users with information on how quickly, cost effectively and successfully a company will be able to reposition itself in global markets. It allows firms to switch between markets or move business between markets if conditions change and become more or less favourable. The higher the level of competition in markets, the more unstable the markets are as a result of fragmentation. The younger the industry and the more volatile the demand and supply, the higher the marketing flexibility needed by firms for survival.

Traditionally, the management accounting system has concentrated on analysing the firm’s results in isolation, and only corrected actual performance or the plan if there was a deficiency (CIMA, 1997, p.173). Such a system does not assess the key issues that organisations face when developing a marketing strategy. Neither the management accounting nor financial accounting system is structured to deal with information on competitor or industry analysis, market positioning and marketing flexibility. The accounting information system can however be adapted, expanded or changed to accommodate indicators of marketing flexibility and other types of information on flexibility. The following information and ratios may serve as indicators

of the level of marketing flexibility of a firm and may therefore be useful to users of accounting information:

- Information on the range of target markets;
- Information on markets entered and exited during the period under review;
- Information on the competitive strategies of businesses, such as cost leadership or differentiation and changes therein;
- Analysis of the maturity and concentration of the markets in which a company competes in order to determine required flexibility levels;
- Turnover obtained from new markets which are entered;
- Turnover from new or improved products;
- An identification of competitors, potential competitors and their competencies;
- The approximate market share in each market and changes therein;
- An analysis of the marketing flexibility of competitors;
- The number of new markets created through the use of technology, research and development and development of products;
- Product life cycles in target markets;
- Significant events, threats and opportunities experienced in markets during the period under review;
- Significant events, threats and opportunities expected in markets in the foreseeable future; and
- Expected growth of markets.

To internal users the access to information on competitors and marketing flexibility is limited only by their requirements, cost versus benefit constraints and the ability to create appropriate indicators. CIMA (1997, p.72) suggests that sources of competitor data may include information read in financial reports, job advertisements and the financial press, gained from shared customers and suppliers and the inspection of competitors' products (benchmarking) and gathered from former employees. External users of information may use other sources to gain information on the competitive position and marketing flexibility of the firm. However, many such users lack the time, resources and expertise to complete the detailed analysis performed for management. As preparers of the financial reports have often gathered and

processed the information on competitors already, it can be argued that they are best placed to communicate and explain the information to other stakeholders of the firm. One problem is that the disclosure of information on strategy to external users is often viewed as potentially damaging to competitive advantage. A fine line exists between disclosing strategic information that may be harmful to the company and its stakeholders and disclosing strategic information, which is already available to the competitors of the firm, and may be compiled for the organisation's external stakeholders.

7.3.3 Financial flexibility [University of Pretoria.etd](#)

Financial flexibility can be defined as the balancing of cash inflows and outflows. It is also created through short business and cash cycles. In financial reporting the role of the cash flow statement is to reflect, *ex post* the balancing of cash flows. The role of financial flexibility is to create and prioritise potential sources of cash so as to balance the operating, investing and financing activities of the organisation, particularly with regard to unexpected future cash inflows and outflows. Financial flexibility can also be viewed as the creation of a number of feasible financial options for changing the current cash flow patterns of the company. The greater the feasible alternatives open to an enterprise, the higher its potential level of financial flexibility. However, the relationship between the number of options and the level of flexibility is unlikely to be linear. The feasibility and quality of the options also impact on the financial flexibility of the firm. A high level of financial flexibility reduces the number of threats, and increases the available opportunities to the enterprise (Koornhof, 1988). It gives management some measure of control over a volatile environment.

Financial flexibility is a category, which usually interacts with other categories of flexibility. The interaction of financial flexibility with production and marketing flexibility can be illustrated as follows: Assume company A manufactures a product X and that it has no excess capacity. While scanning the markets of product X, the management identifies the probable exit of a cost leader of the same product, which creates an opportunity. In order to meet the increased demand for product X in such an event, company A should increase its capacity to manufacture the product. Management proposes the acquisition of another machine for this purpose. There are various funding alternatives, which, if they are feasible, are indicative of the financial flexibility of the company. They include financing through unused lines of credit, a finance lease agreement, the sale of a separable non-operating asset, or the sale and leaseback of existing machinery. The source of finance which company A chooses will affect its future financial flexibility and risk profile. The ability of company A to exploit the opportunity by increasing its market share of product X arises from its marketing flexibility. The increase in its capacity through the purchase of a machine impacts on its production flexibility, while the available financing alternatives relate to its financial flexibility.

The value of financial flexibility does not arise from being able to respond only to foreseen threats and opportunities. Indeed its main value lies in the ability it provides management of an organisation to respond quickly and cost effectively to unforeseen threats and opportunities. The four strategic aspects of range, time, cost and quality apply to financial flexibility as they do to all other categories of flexibility (see figure 6.11).

Different approaches may be adopted by management to create financial flexibility. One strategy would be to maintain large reserves of financial resources in cash or unused borrowing power (financial slack) so that when an unforeseen change takes place in the competitive and cash flow position of the organisation – such as the introduction of new products or new technology – the organisation can respond quickly and with considerable economic muscle (Donaldson, 1971, p.316). This approach increases potential financial flexibility in the firm, enabling it to respond to increases in required financial flexibility.

Another approach would be to invest financial resources in aggressive marketing, product development and research – so that the company's flexibility lies in being and staying ahead of its competitors, in initiating change and proactively influencing the environment rather than responding to it. This management approach would reduce uncertainty and volatility in the environment and lower required financial flexibility. A third approach may be to increase the cash flow tempo of the firm and monitor the levels of committed and uncommitted cash.

Donaldson (1971, p.302) undertook three case studies on management practices for the creation of financial flexibility. He then developed a strategy for managing the levels of financial flexibility in an entity which consists of the following four dimensions:

- An evaluation of flexibility resources for specific contingent needs. Management specifies the foreseeable circumstances (for example business recession) against which it wishes to be insured. It then obtains a quantitative

measure of the range of potential cash deficits together with a quantitative measure of the available resources of cash flexibility to cover the deficit.

- An evaluation of the flexibility resources at the planning horizon. This dimension divides future time into the period covered by detailed forecasting and financial plans and the time beyond that planning horizon. The evaluation of resources of financial flexibility at the horizon is intended to be responsive to the needs for flexibility during the relevant time period even extending beyond the period of specific planning. This is in line with the requirement that financial flexibility should enable management to deal with both foreseen and unforeseen change.
- The establishment of priorities to determine the sequence in which several sources of flexibility will be committed. This results in the matching of the anticipated need for cash with the most appropriate source of cash, bearing in mind the magnitude, certainty, predictability and speed with which the cash will be required.
- The implementation of a strategy of flexibility is based on continuous negotiation because the relocation of financial resources requires the collective agreement of several people both inside and outside the business, who often have different viewpoints.

The usefulness of information on financial flexibility to stockholders is well recorded. In the USA the FASB (1978) concluded that financial reporting should provide information that is helpful in assessing the amount, timing and uncertainty of prospective cash flows of an enterprise. SFAC No.5 (FASB, 1984) elaborates further on the use of cash flow changes, stating that statements of financial position include information that is often used in assessing an entity's liquidity or financial flexibility. Hendriksen and Van Breda (1992) believe that information regarding solvency and financial flexibility help investors and creditors to predict cash flows more accurately by permitting predictions of the probabilities of future returns and not only of expected values. The AICPA (1993, p.56) states that whether an entity will be able to carry out its plans and objectives in the normal course of business is often a function of its financial flexibility. It is suggested that users of financial statements need to know

about an entity's financial flexibility or its lack thereof, when it is reasonably possible that such flexibility will be called upon in the future.

In Financial Accounting several attempts have been made by standard setters to include information on financial flexibility in financial reports. The first significant document on the disclosure of financial flexibility was issued as a Discussion Memorandum by the FASB in 1980. In this DM financial flexibility is viewed as a measure of the adaptability of a business and it recommends the disclosure of the following items in the financial statements:

- How soon investments can be converted to cash;
- The ability to obtain additional financing;
- The amount of operating assets;
- The ability to increase short-term fund flows by modifying operating and investing activities, including the ability to discontinue operations or sell operating assets.

As a result of the FASB's DM and the research of Donaldson, the term "financial flexibility": appeared in a number of accounting exposure drafts and statements on cash flow information (see for example FASB, 1986; FASB, 1987; SAICA, 1985; SAICA, 1986). Unfortunately it was mainly limited to cursory references to and explanations of financial flexibility and the proposals of the FASBs Memorandum remains largely unimplemented. In 1993 the AICPA attempted once again to address the disclosure of information on financial flexibility in an Exposure Draft. The ED used a much narrower definition of financial flexibility than those in both the FASBs DM of 1980 and SFAC No.5 (1984), and effectively deals only with the ability of the enterprise to fund shortfalls in expected cash payments over cash resources. The ED contains a requirement that a discussion has to be included in the notes to the financial statements regarding management's expected course of action in cases where it is reasonably possible that the entity will not have the ability over the shorter term to pay its expected cash outflows without taking certain actions. This information allows users to identify and develop the most probable scenarios, should unexpected threats or opportunities occur. Such actions include the following:

- Borrowing directly or indirectly;
- The liquidation of assets, either directly or indirectly;
- The enactment of new taxes;
- The reduction of costs;
- The reduction of dividends;
- The reduction or elimination of services;
- Capital stock issues; or
- Filing of bankruptcy protection.

In some of the comments received on the ED serious reservations were expressed about the disclosure of information on financial flexibility, the argument being that the cost of the necessary disclosures would exceed the benefits, particularly for small, privately owned entities. When the ED was finally issued in 1994, it excluded any requirements to disclose information on financial flexibility, which was identified in the comment on the draft as its most controversial requirement.

In 1978 Heath already expressed the opinion that more research was needed to determine which ratios or other indicators could be used to measure financial flexibility. Koornhof (1988) identified four major sources of financial flexibility that may be useful to the stakeholders of an organisation:

- The potential for utilising finances. This includes the ability to raise and repay equity capital and outside finance and to change existing financing structures;
- The potential for altering investment strategies by disposing of non-operating and separable assets;
- The potential for altering operations by changing cost structures, pricing policies and product mixes; and
- Other quantitative and qualitative information that could potentially change existing cash flow patterns, such as future expansion and diversification plans, capital commitments, changes in group structures and company strategy.

Examples of indicators and information that may be useful include *inter alia*:

- A table of summarised indicators, including the cash flow cycle, recovery rate and borrowing capacity;
- Ratings of commercial paper, bonds and preferred stock;
- The amounts of unused lines of credit;
- Restrictions on the sale of assets, on additional financing in loan and other agreements, and in the Articles of the company;
- The amount and market value of non-operating assets;
- Information about the separability of assets;
- Segregation of discretionary and non-discretionary expenses;
- Ratio indicators included in contracts;
- Commentary in the form of a management discussion and analysis of aspects such as financial policy, planned capital expenditures and expected sources of financing;
- Information about variations in financial flexibility within a period (FASB, 1980b);
- The cash flow cycle and the discretionary and non-discretionary portions of existing cash resources;
- Information on future changes in production, reorganisation of production lines, the introduction of new products and discontinuance of existing products, and the business cycle;
- Information on company strategy regarding financial flexibility;
- The target indicators and/or ratios set for required financial flexibility compared to actual financial flexibility;
- Information on foreseeable threats and opportunities that may impact on financial flexibility;
- A list of sources of cash prioritised in order of possible use; and
- Information about agreed on future reallocations of resources.

The function of financial flexibility is to ensure that an entity will be able to carry out its plans and objectives in the normal course of business (AICPA, 1993). It enables the entity to adapt to a changing environment by having access to sufficient funding to avert threats and exploit opportunities. It provides management with a means of controlling, to some extent at least, a volatile and dynamic environment.

7.3.4 Informational flexibility

Informational flexibility refers to the ability of a company to alter and adapt its information system in response to the changing demands for information from its users. Ward (1992, p.298) suggests that the accounting information system must be sufficiently flexible to adjust to each new set of critical success factors. An organisation with informational flexibility produces reports that are communication tools rather than just compliance documents and focuses on the needs of their clients – the users of the information.

Technology may be used to make an information system more flexible through the design of flexible software and hardware configurations. It introduces new methods of data collection, processing and business reporting to fulfil the changing and expanding information needs of the users. Technology allows communication processes to become faster, efficient, powerful and more flexible. Ernst & Young (1995) submits that the progress in technology in collecting, analysing and disseminating information, threatens to make the traditional cycle of annual and quarterly reporting irrelevant. Informational flexibility is largely a function of technological advances which allows one rapid and accurate access to and processing of information.

On the other hand, technology can increase the informational inflexibility if it is used incorrectly. Pasmore (1994, p.77) noted that a lack of technical flexibility is rarely due to the limits of technology. More often the lack can be ascribed to human limits in the sense that people may ignore the need for it, fail to provide for flexibility in the system design or allow too much flexibility into the system. Too much flexibility poses a particular threat to informational flexibility, namely the threat of complexity and entropy. Peters (1991, p.589) notes that the need for flexibility in an increasingly complex environment requires information systems to be simplified so that they can be amended, altered and expanded in response to changing demands for information.

A process of continuous improvement in the information systems and the creation of flexibility requires the removal and elimination of waste, duplication and, redundant information and processes. This implies that the organisation needs one flexible information system that can cater for the needs of all users. The creation of two information systems to service the differing needs of internal and external users would represent a form of duplication and thus waste. Removing for example unnecessary and costly data capturing and processing procedures can also reduce waste in the information system. Johnson (1992, p.128) notes that companies such as Hewlett Packard and Harley-Davidson are celebrated for making dramatic reductions in cost and effort in tracking accounting transactions, following on their earlier successes in simplifying work and reducing resources in production processes. In their case study Turney and Anderson (1989) found that many of companies' existing accounting systems were obsolete as they were designed to collect data that no longer existed, such as inventory in a JIT environment or reported information that was no longer used by management.

Information on the flexibility of information system is useful because an organisation with a high level of such flexibility will be able to generate information required to support decision making faster and more efficiently and cost effectively than its competitors while still maintaining informational quality and integrity. In theory, the users of information in these flexible firms should be able to make more informed and timeous decisions about the future. The financial and business reporting function will add value to the organisation and management if the function is treated as a flexible programme that extends beyond the annual financial statements and traditional performance measures.

From external users' perspective, informational flexibility enables organisations to meet their changing needs through flexible reporting. In a flexible reporting approach there is recognition for the fact that the needs of users differ and it is suggested that the types and timing of information in business reporting can be customised to meet both users' needs and cost constraints in particular circumstances (AICPA, 1994a). A proposal of the Jenkins Report (1994a, p.52) is that private companies and external users should negotiate and agree on the following aspects of reporting:

- The type of information; [University of Pretoria.edu](http://UniversityofPretoria.edu)
- The frequency of reporting;
- The time frame of reporting;
- The timeliness of reporting;
- The extent and nature of auditor association.

Such an approach to business reporting will still require firms to have high levels of informational flexibility in order to respond to the changing demands and agreements of their users for information.

Business reporting by public companies must meet a broad range of users' needs for company-specific information. The communication of such information should not, however, be restricted to the financial reports. There is an increasing demand for operating and other non-financial information. Technology can support the introduction of more flexibility into reporting to accommodate these changing needs. The Task Force of the Canadian Institute of Chartered Accountants task force is currently reviewing the Jenkins Report and will make recommendations on areas for further consideration and amongst others on new methods of business reporting in an electronic environment (Ernst & Young, 1995). In the United Kingdom a survey of 120 larger companies indicated the main benefit of information technology in the future is expected to come from improvements in the speed, accuracy, reliability and flexibility of information provision in key areas such as costing, pricing and management information. The ICAS (1988) suggests that electronic means may be used cost effectively in future to communicate information, and the SEC of the USA is already using an electronic data gathering and retrieval system (AIMR, 1993).

The level of informational flexibility in a firm can be assessed by indicators such as the response time required to meet new information requests, the number of problems addressed in the system during a specified time span, the number of subsystems changed, the number of new systems introduced, changes to the gathering and processing of information, the number of instances in which redundant information was removed and the access time required to obtain information.

Information on the structure of the accounting function may also be indicative of the informational flexibility of an organisation. Informational flexibility requires a decentralised accounting function in which accountants are multiskilled members of crossfunctional teams. Informational indicators may be communicated to internal users through reports and summaries. Required targets should be communicated with reference to the actual indicators, and the progress towards meeting the required targets should be monitored constantly.

Assessing the level of information flexibility from an external user's perspective becomes more problematic especially where direct electronic access to information is not available. Indicators of the informational flexibility of the organisation may be based on the use of electronic processing as stated in the financial reports or press. Further indicators may be the use of the Internet and Intranet in the organisation, a willingness to experiment in financial reports, a short response time to specific queries and a willingness and ability to obtain information not specifically produced by the information system.

The introduction of flexible information systems and informational flexibility will enable firms to process vast amounts of information quickly and accurately, and to communicate this information timeously and cost effectively to the various users. In future, the emphasis of the accounting information system will shift from data gathering and processing to communicating information efficiently to users, to establishing and meeting the changing needs of users and to interpreting the information which is provided.

7.3.5 Geographical flexibility

Geographical flexibility refers to the flexibility gained by companies that maintain or can cost effectively create a presence in more than one country. This positioning allows them to exploit asymmetries, inequities, inequalities and favourable conditions by switching business or profits between countries. Geographical flexibility concerns the ability of a multinational enterprise to create a hedge against unfavourable governmental practices and uncertainty. It is realised by the interaction between the competitive advantage of firms and the comparative advantage of countries.

Kogut (1985) recognises the existence of this category of flexibility and says that MNEs have flexibility, which permit them to hedge against the uncertainty about future exchange rates, competitive moves or government policy. By internalising tax management and other aspects of government policy, and thus creating geographical flexibility, management can add additional value to a firm. Muralidhar (1992) suggests that investors may find that investing in multinational firms provides more value than purchasing shares in a replicating set of nationals in two countries. The potential value of geographical flexibility increases as the volatility and uncertainty in world markets increase as a result of government policies, labour practices and exchange fluctuations.

Information which focuses on geographical flexibility is useful to management as it allows them to consider options that may enhance the value of the organisation and provides them with a means of effectively limiting the power of government and labour in respect of fiscal, monetary and legal policies. To external users, information on geographical flexibility is useful because companies with high levels of geographical flexibility are in effect less exposed to the risk of unfavourable changes in tax regimes, factor costs and exchange rates than companies with low levels or no flexibility. Users are able to assess more accurately the risk profiles of companies by differentiating between companies with geographical flexibility and companies without such flexibility.

According to Muralidhar (1992) flexibility in MNEs can give rise to major advantages when the demand for products, factor costs and tax regimes are volatile. The advantage can be in the form of real and/or financial flexibility. Here financial flexibility is defined as the ability to shift profits to favourable tax locations while real flexibility is the ability to switch capacity utilisation to the lowest cost location when domestic costs and exchange rates are volatile. Both types of flexibility fall into the category of geographical flexibility. Muralidhar (1992) provides the following examples of the implications of geographical flexibility:

- In instances where tax regimes are variable and less than perfectly correlated between countries, tax savings are possible by shifting income. Enterprises

with international business can therefore improve expected firm value by investing abroad and at home. This will also benefit firms that invest abroad in *anticipation* of possible future tax rate changes at home, even if the current expected after-tax rate of return at home is greater than the current tax rate of return abroad. It follows that the greater the expected volatility in tax regimes, the greater the value of geographical flexibility.

- In instances where corporate tax obligations are variable and multinational firms have geographical flexibility in the form of an option to shift profits to favourable tax locations, the traditional net present value analyses of foreign projects do not capture the value of this flexibility. The options pricing models used in decision making should include the value of the geographical flexibility component of such foreign projects.
- When multinational firms have geographical flexibility, in the form of the option to switch production to the lowest cost location when either factor costs or exchange rates change, the net present value analyses of foreign projects will again not capture the full value of this type of flexibility. An option pricing model should be used to value the geographical flexibility component of such foreign projects and the value should be included in the net present value models prior to decision making.

With regard to geographical flexibility, Kogut (1985) comments that the unique content of a global versus a purely domestic strategy lies less in the methods used to design long-term strategic plans, and more in the construction of flexibility which permits firms to exploit uncertainty over future changes in exchange rates, competitive moves or government policy. He uses the term “strategic flexibility” rather than “geographical flexibility” in his research and identifies two subcategories of flexibility, namely the arbitrage of market imperfections, and leverage by which a firm’s position in one national market is enhanced by its position in a second market. Arbitrage opportunities reflect the exploitation of price differences in assets or factors of production between markets and include production shifting, tax minimisation, arbitrage in financial markets through imbalances in government policies and information arbitrage through imbalances in information on seller and buyer distribution, innovation, research and development, and accounting practices.

Leverage opportunities reflect the creation of market or bargaining power as a result of a global position (including global co-ordination and the ability to differentiate prices in response to changing markets) and political risk (which is the bargaining power gained by having dispersed operations) (Kogut, 1985).

The accounting information that may be used to monitor and develop the geographical flexibility of an organisation includes an overview of the geographical locations of businesses together with the results, relevant financial and non-financial information of each segment or strategic business unit, including the results, net cash flows, asset base per business segment, as well as the number of employees, number of units produced, number of units sold, orders received per segment, idle capacity, and a comparative analysis of the taxation, legislature, labour practices and governmental policies of the countries where businesses are located. The following may also be included:

- A summary of the relevant changes that have taken place in countries during the period under review;
- A summary of the expected changes in the countries where businesses are located with regard to such aspects as tariffs, labour, taxation and company legislation;
- Changes in business location and redirection of business activities as a result of geographical flexibility options being exercised;
- Information on recent exchange rate fluctuations between the countries where businesses are located;
- Information on the costs involved in changing from production locations and tax regimes;
- Information on geographical flexibility capabilities that may be created in a short period of time and on a cost effective basis, such as the existence of agents, branches and licensing agreements; and
- Information on arbitrage opportunities exploited during the current period.

Certain information on geographical flexibility, such as the shifting of profits between countries through transfer pricing to benefit from inequities in tax legislation may be

of a sensitive nature. Consequently, access to it may be restricted to internal users, for governments are aware of and seek to limit such practices. These practices are however difficult to control and the introduction of common or at least comparative tax systems may be a possible solution. Lessard (1979) noted in this regard that it seems quite natural that if internal financial transfers are unconstrained and uncontrolled, tax factors could magnify the global distribution of tax revenues.

Accounting standards currently exist in several countries requiring the disclosure of the geographical distribution of business segments. However, these requirements are often limited to aggregate amounts of income and assets per segment, which is of limited use in assessing the levels of geographical flexibility available to enterprises. The statements may also require disclosure of transfer pricing policies. It is therefore not surprising that companies are very unwilling to disclose their policies on geographical flexibility and arbitrage on the one hand, while governments are increasingly concerned about controlling such practices on the other.

7.3.6 Human, cultural and organisational flexibility

This category is arguably the most important and pervasive source of flexibility in the organisation and is also the most difficult to measure. For this reason it is a category that has been largely ignored and excluded from the traditional information system in organisations. This category really consists of four subcategories:

- The managerial capabilities for creating flexibility;
- The capabilities of employees to be flexible;
- The creation of a corporate culture which supports flexibility; and
- The use of an organisational structure which fosters flexibility.

Flexibility in the other five categories cannot be achieved unless the people in the organisation are flexible and responsive to change. This category therefore underlies the creation of flexibility in the other categories.

The capabilities of management for the creation of flexibility arises from their ability to progressively replace specialised routines with dynamic capabilities (Volberda, 1998). Specialised routines originate from management's ability to replicate tasks performed in the past while dynamic capabilities require management to solve complex non-routine problems. Specialised routines are suitable in stable predictable times while dynamic capabilities are required in volatile, unpredictable times. The management capabilities used to create flexibility should therefore be aligned to the level and nature of change and volatility in the environment. Management capabilities are based on the variety of alternatives and the speed within which these capabilities may be utilised.

Volberda (1998, p.418) identified four types of flexibility, namely steady-state, operational, structural and strategic flexibility. Examples of operational flexibility include the ability to change production volumes (also called volume flexibility), build up inventories and use temporary labour and outsourcing. Structural flexibility is seen in the ability to create crossfunctional teams, alter control systems, allow suppliers to develop sub-components and install JIT. Strategic flexibility is apparent in the ability of management to change current strategy, introduce new technology and products, raise mobility barriers in markets (marketing flexibility) and use arbitrage to control government actions (geographical flexibility). Information on the above examples provides users with an indication of the level of flexibility created by management.

Some people are more flexible than others and people with inflexible attitudes and mind sets often inhibit the flexibility of the organisation and the creation of a culture of flexibility. Pasmore (1994, p.47) identified flexible people as open minded, willing to take reasonable risks, self-confident, concerned and interested in learning. They are creative and willing to experiment with new behaviours in order to make better choices about viable alternatives in given situations. They are able to learn from own experience as well as the experience of others and are not opposed to new ideas or bound by tradition. They possess basic skills that allow them to adapt readily to new circumstances and view themselves as able to make the best of opportunities. Such employees are active, resourceful, curious and good communicators and listeners. Flexibility may be cultivated among employees by using approaches developed in the behavioural sciences, such as participation (Coch & French, 1948; Lowin, 1968;

Argyris, 1964), although the results obtained from participation research is often conflicting. New variables, deterrents and explanations are constantly being added in efforts to resolve the mixed research results in this area.

Corporate culture refers the set of beliefs and assumptions held commonly throughout the organisation (Bate, 1984). For an organisation to become flexible, flexibility should become part of corporate culture. Volberda (1998) suggests that a conservative culture restricts the potential for flexibility while an innovative culture enhances such potential. Four aspects determine whether a culture is conservative or innovative:

- Identity formation – how pervasive are views on the identity of the organisation. A heterogeneous identity with a broad scope makes the organisation more susceptible to flexibility.
- Leadership – a delegative leadership with an attitude of improvisation is more conducive to flexibility.
- Unwritten rules – broad, tacitly understood rules which direct the actions of employees. If these rules create an environment tolerant to ambiguity and change and support weak socialisation and discipline, the environment will be conducive to the enhancement of flexibility; and
- External orientation – the beliefs about the relationship between the organisation and its environment. If the focus is long term, the system is viewed as open and planning is directed towards creating an idealised future vision, which enhances flexibility (Volberda, 1998, p.165).

The more tangible area of this category lies in the flexibility that can be created in the manner in which an organisation is structured. A hierarchical structure with formal lines of authority, job descriptions, clearly defined functions and control systems destroy organisational flexibility, while a fractal or organic structure using crossfunctional self-focusing teams, rudimentary control systems and a flat hierarchy will serve to develop and support this flexibility.

The development of flexibility in an organisation is a process rather than a goal. As such, it is not the basic structure of the organisation that enlarges its potential for flexibility, but rather the opportunity and ability to continuously rearrange the structure (Volberda, 1998). The structure of the organisation should be aligned to the extent and type of change in the environment. In times of discontinuous change and high volatility the organisational structure should be organic and open, so as to increase its exposure to the environment and allow the reshaping of its structures to take place. During stable times with incremental change, more mechanistic and closed system structures with comprehensive planning systems and control systems will be appropriate. Volberda (1998) contends that the flexibility potential does not arise only from the nature of the organisational form and the planning and control systems, but also from processes of decision making, co-ordination and execution. He includes aspects such as

- the regulation of tasks through the division and interchangeability of the work force;
- the regulation of behaviour through specialisation, formalisation and training;
- the regulation of mutual adjustment by means of flexible mechanisms that encourage informal relationships in organisations (for example liasing and interdependencies); and finally
- the regulation of decision making, based on the extent of delegation and participation.

The issues of human and organisational flexibility and their measurement in an organisation have not been addressed in the accounting literature. Consequently there are no guidelines as to what indicators may be used to assess the flexibility of people in the organisation and the levels of success in creating a corporate culture or a structure which is conducive to flexibility. The use of surrogate measures such as the extent of innovation and creativity in the organisation and extent and content of training programmes, may be considered. The importance of flexibility to an organisation may be advanced further if flexibility measures are used as the basis for incentive schemes or criterion in new appointments. Opinion polls and qualitative scales may provide another means of assessing this type of flexibility. Information on

this category of flexibility is likely to be mainly qualitative, because it is constrained on the one hand by the difficulty of measuring human and organisational flexibility and the reliability with which such aspects can be measured and by the lack of research in this area on the other. However, this should not prevent stakeholders from attempting to measure this very important and fundamental source of flexibility in organisations, for it has or can have a number of benefits, such as the following:

- It will make flexibility and strategy more visible;
- Through measurement, it will be possible to determine whether predetermined goals were attained and if necessary, to revise aspiration levels;
- It will serve to establish decision-making norms; and
- Measurement will make the area appear more concrete and manageable.

7.4 Procedures for measuring and reporting on flexibility

The measurement of flexibility is an area which requires further research. Measurement allows management and accountants to assess the current position of the organisation regarding its flexibility and then to specify the levels of flexibility that should be attained in response to changes in the environment. Furthermore, it allows management to monitor progress, create further flexibility, make flexibility more visible to employees and to incorporate flexibility more effectively into their strategic decision making. Gerwin (1993) suggests that the main stumbling block to advances on both the theoretical and applied fronts is the lack of measures for flexibility and models for establishing its economic value.

In this chapter the development of measures for flexibility rather than its economic value is addressed. It is proposed that an evolutionary approach be followed in the development of flexibility indicators. This implies that individual organisations should develop their own flexibility measures. Such development will probably result in the emergence of a number of generally used indicators of flexibility (figure 6.16). It is hypothesised that these measures may be used to

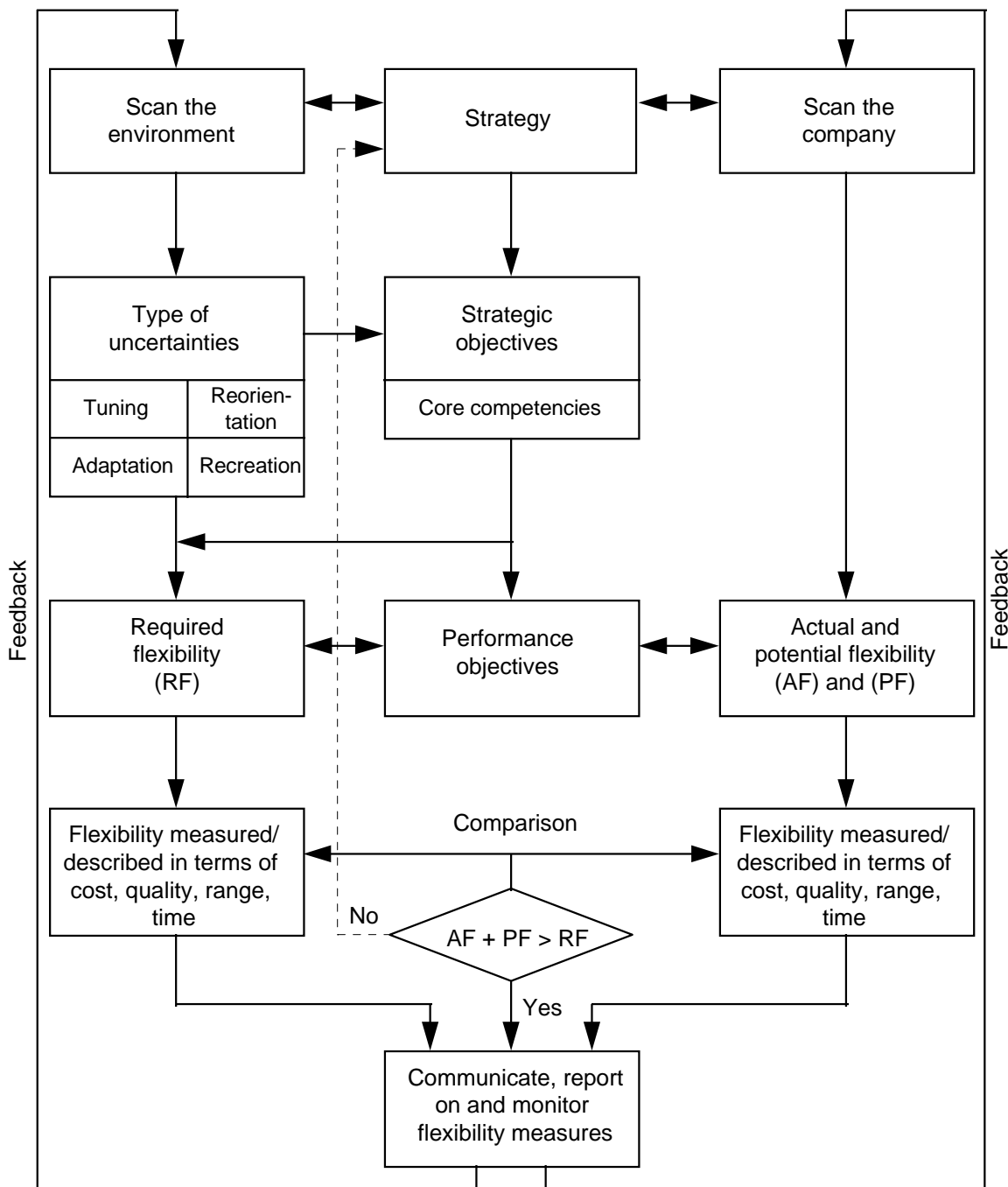
- develop industry indicators; [University of Pretoria.etd](http://www.uct.ac.za/~lib/University%20of%20Pretoria.etd)
- develop scales for assessing organisational flexibility;
- refine existing proposals to value flexibility in organisation; and
- refine existing models such as failure prediction models and DCF models.

The purpose of this section is to provide comprehensive procedures to management and accountants that may serve as guidelines for the development of flexibility measures in their organisations. The development of the procedures have been based on the following research:

- The nature of change and the responses thereto, that is, the tuning, adapting, reorientation and recreation described by Nadler and Tushman (1995);
- The types of flexibility, that is, actual, potential and required flexibility suggested by Gerwin (1993);
- The necessity of concentrating on core competencies, proposed by Prahalad and Hamel (1990);
- The idea of assessing flexibility in terms of cost, quality and time, developed by Ansari *et al.* (1997) and range and cost suggested by Slack (1983);
- The process for determining flexibility requirements by identifying the nature of uncertainty, the strategic objective and then the flexibility objective, developed by Gerwin (1993); and
- Both General System Theory and the work of Volberda (1998) on the FAR system in the logical sequence of procedures.

The suggested procedures to be followed by management and accountants in measuring flexibility are illustrated in figure 7.2.

Figure 7.2 : Procedures for developing flexibility measures



Source: Own observation.

The development of flexibility commences with scanning of the environment in order to identify the nature and pace of change. Volberda (1998, p.235) suggests a structured survey of environmental turbulence to assess the extent of change and uncertainty in the environment. The nature of change in the environment could be either incremental or discontinuous, and the predictability of change will result in

either anticipated or reactive action. This forms the basis for the response of management. The management actions are tuning, adapting, reorientation and recreation. When tuning or adapting is required, management uses its knowledge of the uncertainties and corporate strategies to develop specific strategic objectives. These strategic objectives should be concentrated on the core competencies of the organisation through which the firm can develop competitive advantage. The strategy objectives are refined to identify the specific areas in which flexibility should be developed. Management identifies required flexibility as the benchmark towards which the organisation should aspire and it is identified on the basis of the environment scan. Once the required flexibility mix has been identified, the performance objectives can be identified which form the basis for the development of required flexibility indicators.

Next the current status of these types of flexibility in the organisation are determined. The actual and potential flexibility of the firm are established through a scan of the company and its task environment. Actual flexibility refers to flexibility capabilities already in use while potential flexibility refers to unused capabilities which may be activated almost immediately at a low cost. The steps in the development of flexibility indicators illustrated in figure 7.1 have been incorporated into the more comprehensive procedures in figure 7.2.

Once the required mix of flexibility has been determined, the accountant should develop accounting measures, which indicate the current levels of flexibility (actual, potential and required) and which may be used to communicate, report on and monitor progress towards predetermined objectives. These flexibility measures may be of a financial or non-financial, or a qualitative or quantitative nature and will be measured in relation to competitors in the four strategic areas in which they may be outperformed, namely the cost, quality, time and range aspects (see figure 6.7). The required flexibility measures are then compared to the actual and potential flexibility measures to identify both areas in which more flexibility is required or areas of excessive flexibility. If the actual and potential flexibility exceeds the required flexibility, the information is communicated and monitored. Excessive flexibility may result in a loss of corporate identity and stability and ultimately in a chaotic firm (Boynton & Victor, 1991; Volberda, 1998). A relatively small surplus of flexibility may,

however, be useful in future responses and may be “banked” until needed. If the required flexibility exceeds the actual and potential flexibility, the firm should attempt to lower the required levels by influencing the environment or alternatively by raising potential flexibility via changes to internal conditions and capabilities. In an attempt to increase potential flexibility, the strategic objectives and performance objectives of the firm may require change. The development of flexibility measures is thus a continuous process of realignment as indicated by the feedback arrows to the start of the process, namely scanning of the environment and the organisation.

These procedures for the development of flexibility measures should be used at different levels. Initially the flexibility position of the SBU or enterprise should be assessed. The measures developed here will probably be largely in the nature of an opinion poll and qualitative and descriptive. The next level would be the analysis and development of measures in the human, cultural and organisational category, a category which is pervasive in the organisation. As stated in a prior discussion, these indicators would mainly consist of qualitative measures, opinions and descriptions unless financial and quantitative surrogates such as the training costs of personnel during a financial period or the number of innovations are used as measures. At the next level the development of measures in each of the remaining five flexibility categories – production, marketing, financial, informational and geographical flexibility – will be dealt with, where applicable.

7.5 Illustrative example

The use of the proposed procedures for developing flexibility measures will now be illustrated by means of volume flexibility. Volume flexibility arises from the ability of the organisation to change its production levels and thereby its volume of products. The management of company A commences the process by scanning the environment, its markets, customers and competitors, to establish the extent to which product demand is likely to vary in the future. Assume that the changes in demand can generally be anticipated and that it has an incremental nature. This requires a tuning management response. Tuning requires limited organisational change such as

improving methods, processes and procedures, introducing new technology or enhancing co-ordination. As a result of the required turning response, management identifies specific strategic objectives, which are derived from corporate strategy and the identified core competencies of the firm. Assume that a strategic objective of the firm is to retain market share. The nature of the flexibility required is identified by management as volume flexibility. The strategic objective and required flexibility are refined into more detailed performance objectives such as the monitoring of customers preferences, the extent of potential changes in demand, the identifying factors affecting changes in demand, the current capacity and the keeping of low stock levels. The nature of uncertainty and stated objectives of the company determine the required level of flexibility. As the level of uncertainty in this example requires tuning, lower levels of a required flexibility may suffice. In instances where a reorientation response is required, higher levels of required flexibility are necessary to act as a buffer against the increased and unforeseen change. The required volume flexibility can be measured using indicators such as the range of product level changes that should be accommodated, the required time span within which the changes in product levels should be effected and the maximum amount of costs that can be incurred in making such changes. An indicator of the quality of products, such as the number of reworked products or the number of rejected products, may be used to ensure that the quality requirements for these products are maintained at a specified level during the change process.

Once the required flexibility has been identified and measured, the management and accountants of company A should identify and measure the actual and potential flexibility in the organisation. This is done by scanning and analysing the conditions and capabilities in the company. The actual volume flexibility is measured by identifying the current range within production levels. The production levels in company A are assumed to be constrained by its existing capacity (acting as a "ceiling") and by its breakeven point (acting as a "floor"). The actual time span of changing production levels can be based on prior experience, incorporating any subsequent changes which may affect the lead time. The accountant of company A costs the process of changing production levels for the different scenarios and uses (probably) an average cost. The quality indicator based on actual reworked products

after changing production levels, acts as a control measure to ensure that the quality is maintained during the process.

Of the three levels of flexibility (required, actual and potential) the latter is the most problematic to identify and measure. Potential flexibility in company A arises from the ability of management to employ existing capabilities and conditions not currently in use to enhance its level of volume flexibility. Management may also extend the potential flexibility of company A by changing capabilities and conditions in the organisation through reorganisation and restructuring. Assume that company A has potential flexibility available from a backup machine that may be used to increase the current capacity. Assume further that employees are currently being trained to become multiskilled. A result of the training is that the lead times and costs involved in a change in production levels will decline substantially.

Once the management and accountant have identified and measured the volume flexibility indicators, the required flexibility indicators are compared to the actual and potential flexibility. In the case of company A it is assumed that the actual flexibility is lower than the required flexibility. However, the actual and potential flexibility, exceed the required flexibility. This implies that management and employees will have to use internal conditions and capabilities to create further volume flexibility as and when required. The accountant may attach a suitable weighting to the four indicators of volume flexibility (range, cost, quality and time) to complete the comparison. These indicators are then communicated and reported to stakeholders. The required flexibility indicator is identified as the benchmark, while the actual flexibility reflects the current position. Employees of company A should strive towards raising the current flexibility to the required flexibility level, by harnessing more of their own and the company's potential flexibility. The process is constantly reassessed by the management in company A, in a process of rescanning the environment and the company for any changes.

7.6 Summary

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Flexibility is the most cost-efficient method for coping with environmental change and uncertainty (Aaker & Mascarenhas, 1984). It is a function of uncertainty. Its value does not lie in the present or the past, but rather in the future. Flexibility allows the management of a firm to partially control a volatile environment by positioning and repositioning the firm in response to changes in the environment. The construct of flexibility is complex, elusive and multidimensional. It is nonetheless a very useful vehicle for creating a robust organisation, which can absorb volatility. To make flexibility visible and monitor progress made in creating and maintaining flexibility, the management and accountants of organisations need to identify, measure and communicate information on flexibility. The measurement of flexibility is, however, an area in which limited research has been conducted. The development of measures of flexibility therefore requires innovation and experimentation within organisations themselves.

There are two main aspects of the measurement of flexibility that should be addressed – the determination of its economic value and the development of flexibility indicators. It is suggested in this chapter that an evolutionary approach be adopted in the measurement of flexibility. Firstly, management and accountants in organisations through innovation and experimentation should develop indicators of flexibility. Some of these indicators will then evolve, through generally accepted usage to industry indicators. Such indicators may then be used to develop scales of flexibility, which will serve to distinguish between flexible and inflexible firms. The indicators may also be used in models to determine the economic value of flexibility and to refine other models, such as corporate failure prediction models, and discounted cash flow models.

In pursuance of this approach the classification scheme proposed in chapter 6 was used in this chapter to develop flexibility indicators in the six categories. In each of the categories examples of flexibility indicators were provided and the means of reporting such information briefly discussed. It is suggested that the most cost effective vehicle for communicating this type of information is the accounting

information system, as it has the necessary infrastructure. The problem that arises, however, is that the accounting system is not geared toward dealing with a construct such as flexibility. This problem may be solved by using a parallel information system, as proposed by Donaldson (1971). However, two information systems are not a cost-effective solution. A more acceptable solution would entail changing the existing accounting information system and using information technology so that the scope of information that is communicated can be broadened. This is an aspect which is discussed in more detail in the next chapter. The chapter concludes by proposing procedures that management and accountants may follow to develop flexibility indicators for their organisations.

The chapter addresses an area in research on flexibility which has been identified as “the single most important research priority” (Gerwin, 1993), namely the measurement of flexibility. The aim has not been to propose a comprehensive list of flexibility measures which should be used by all companies. Instead, examples were used to indicate that many of the categories of flexibility can either be measured or described. Furthermore, an evolutionary approach is suggested for the development of such flexibility measures in organisations. To prescribe flexibility indicators would make organisations inflexible. As a guideline to accountants and managers, procedures are proposed which may assist them in the identification of flexibility information and indicators in their particular organisations. The measurement of flexibility is however, a dynamic and demanding field of study that requires the input of many researchers.