Developing a framework for flexibility within organisations

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Recent research in Management Sciences has shown that flexibility is an essential characteristic of successful enterprises in a highly competitive and rapidly changing business environment (Kogut, 1985; Ansoff, 1988; Pasmore, 1994; Volberda, 1998). Consequently, management should not only understand flexibility but also be able to create flexible organisations and to measure and monitor flexibility. However, flexibility is a nebulous, elusive and multidimensional concept which is poorly understood and seldom managed and measured in enterprises (Gerwin, 1993; Parthasarthy & Sethi, 1993; Upton, 1994).

The purpose of this article is firstly, to define the construct *flexibility* and secondly, to develop a conceptual framework that explains its multiple attributes in organisations. This framework is used as a basis for the measurement of flexibility. The article suggests procedures that managers can apply to develop indicators of flexibility and these indicators are used in turn, to identify current levels of flexibility, to set targets for flexibility and to monitor the progress made towards the achievement of these targets.

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Background and topic area

The rapid and discontinuous change that occurs in the environment has a direct impact on the way in which businesses are managed. Managers are finding that old recipes for success are no longer as effective as before. Consequently, they are, of necessity, adopting new approaches to the management of their companies. The essence of management in the contemporary turbulent environment is the management of change and Nadler and Shaw (1995) contend that the businesses that will survive in the approaching decades will be those business that are capable of responding quickly and effectively to changing environmental conditions. This view places a premium on particular capabilities such as adaptability, flexibility and responsiveness. These authors also conclude that the management of these successful firms will learn and act more rapidly than their competitors and that they will become effective anticipators and managers of extensive change as well as effective change agents.

Several researchers have recognised that flexibility is an essential characteristic of successful organisations in a highly competitive and rapidly changing business environment (Kanter, 1982; Kogut, 1985; Ansoff, 1988; Peters, 1991; Johnson, 1992; Pasmore, 1994; Volberda, 1998). This fact suggests that management should not only understand the construct of flexibility, but should also know how to create, measure and monitor flexibility within their enterprises. Managers of businesses are aware of the benefits of being flexible, but appear to lack the knowledge and skills necessary to create this elusive quality in their organisations. Steers (1975:549) found in a survey of managers that flexibility was the evaluation criterion mentioned most often in organisations. Although managers recognise flexibility as a means of addressing organisational problems, the areas regarding the enhancement of flexibility remain largely unexplored (Eppink, 1978).

Research gap

The area of flexibility is, neither well understood nor well researched (Volberda, 1998:2). The multidimensional aspects of flexibility are often not recognised and conflicting definitions of flexibility abound (see for example Donaldson, 1971; Ansoff, 1988; Gerwin, 1993; Volberda, 1998). Consequently, attempts by management to introduce flexibility are usually based on *ad hoc* approaches rather than organised and structured approaches. These approaches are often being limited to a few well-tried methods and the creation of flexibility have tended to focus upon areas such as in manufacturing and financing (Aaker & Mascarenhas, 1984).

Aaker and Mascarenhas (1984:75) suggest that this situation is exacerbated by a lack of frameworks and procedures in the relevant literature to guide management in the creation of flexible organisations. Furthermore, they note that once flexibility options have been created, management's judgement about these options is often subjective and informal. Even less research is available on how flexibility should be recognised and measured by the accounting system. Gerwin (1993:405) contends that the measurement of flexibility is the single most important research priority in this area. Admittedly, flexibility is a difficult construct to measure, especially within the constraints of current accounting and information systems, but this is not sufficient reason to ignore such an important variable in management research.

Within the accounting literature, research is focused on disclosure of flexibility, rather than the measurement. Accounting standard setters (FASB, 1980; AICPA, 1993) have attempted to mandate the inclusion of at least some information on financial flexibility (a category of flexibility) in the financial statements of enterprises, but have not succeeded. Several authoritative textbooks in Accounting refer, if only in passing, to the work on financial flexibility (Kam, 1990; Hendriksen & Van Breda, 1992; Correia, Flynn, Uliana & Wormald, 1993). Other research studies concentrate on the use, rather than on the measurement of flexibility in the management of cash, manufacturing of products and in entry into new markets.

The challenge facing researchers is that although managers of enterprises seem to be aware of the benefits of being flexible, they lack guidance on the creation and measuring this elusive quality in their organisations.

The purpose of this article is to propose a framework that managers can use as a basis for creating and measuring flexibility in their organisations. Within this article the concept of flexibility is defined with a view to delineating the area of research. A classification framework, which identifies categories and aspects of flexibility is proposed. The *levels* of flexibility that should be recognised is identified and the framework is used to develop indicators of flexibility in organisations. Examples are then provided to demonstrate the application of the framework in the development of indicators of flexibility.

Methodology

Researchers' perceptions of reality and the nature of knowledge and truth emanate from the philosophical assumptions that underlie their research and that tend to incline them towards the adoption of certain research methods (Puxty, 1993:29, Hopper & Powell, 1985:429). The theoretical and philosophical assumptions adopted in this paper fall within the *functionalist sociology* quadrate of the Burrell and Morgan-model (1979:29). This category suggests the view that the social world consists of artifacts and relationships that can be identified, studied and measured objectively. The functionalist approach supports the view that the continued existence of an artifact (e.g. a construct such as flexibility) hinges on its usefulness to society. A logical deduction from this statement is that if the artifact cease to be useful and to fulfil its function in society, it will not survive in its present form. In terms of a functionalist perspective, an institution or artifact functions in a certain manner, because that suits the social system. If for any reason it fails in future to suit the social system, it will have to adapt for survival (Puxty, 1993, p.17).

The research further adopts a systems view (a research approach within the functionalist paradigm), which implies that the accounting and information systems organisations are viewed as open systems that are characterised by a constant interaction with the environment. In times of rapid change and turbulence, the relationship between the open system, such as a business organisation, and its environment change. Some of the changes in the system (business organisation) include:

- The achievement of homeostasis or survival becomes increasingly elusive;
- The boundary separating the system and the environment becomes increasingly thin and permeable (Peters, 1991);
- The organisation attempts to expose more of its subsystems directly to the environment, so as to "expand" its boundary with the environment and make itself more sensitive to changes in the environment;
- The two-way traffic between the system and its environment increases substantially;
- The subsystems within the system constantly changes, renews, disappears and grows to meet the needs of the system;
- Feedback becomes increasingly important in the process of constant and rapid repositioning;
- The system creates controlled instability within itself (Stacey, 1992) in a bid to create or anticipate changes in the environment and foster more creativity and innovation from within;
- The interdependence and interaction between subsystems becomes increasingly complex to monitor as the subsystems mutate, merge or disappear; and
- Anticipating the timing and effect of boundary transactions, both internally between subsystems and externally with the environment, becomes increasingly difficult and unpredictable as turbulence increases (Stacey, 1992).

A systems perspective emphasises the need for the system to be aware and responsive to change in the environment in order to survive.

In conducting this research, a literature survey on flexibility in business organisations that covered several disciplines was undertaken. The disciplines include Accounting, Business Management, Finance, Management Information Systems, Organisational Theory, Strategic Management, Systems Theory and Theory of Change. A non-formal research approach as defined by Churchman (1961), rather than a formal research approach was adopted in the development of the construct of flexibility. A non-formal approach is suitable when the aim of inquiry is to discover or develop new ideas and not to test preconceived ones. In this research the purpose is to develop a conceptual framework rather than to undertake primary research. The conceptual framework is based on underlying assumptions regarding the nature of the construct flexibility and the research is mainly of a deductive nature. Examples are used to explain the nature of the various types and levels of flexibility in enterprises and to demonstrate the application of the classification framework to management. To determine the scope and to guide the research design, the model for problem solving developed by Mitroff, Betz, Pondy and Sagasti (1974) was used.

Underlying assumptions

The construct of flexibility in business enterprises was first observed and studied in the 1970's. In 1971 Donaldson observed flexibility in the financing of businesses and he noticed that managers did not always follow the proposed optimising theory with regard to corporate finance which concentrated on optimising the use of debt. Instead managers appeared to concentrate on the magnitude of the debt not in use. These unutilised sources of funding served as a buffer against the effect of unexpected future events. The aim of management was apparently to achieve flexibility by having access to additional funding. This flexibility created alternatives or options for managers when they had to deal with an uncertain and unpredictable future. Donaldson's research suggests that flexibility is an observable construct. Its influence can be observed in (and assist in explaining) the behavior of management both inside and outside the business organisation.

For the purpose of this research two further assumptions regarding the underlying nature of flexibility are made:

- Flexibility is a discriminate construct. In other words, flexibility is a phenomenon that may be used to distinguish the good performers from the poor performers in situations of uncertainty and instability.

- Flexibility is an operational construct. This implies that it can be implemented, measured and used by the management of an enterprise to improve its performance, strategy and competitive position.

From these assumptions it is deduced that:

- Information on flexibility is useful to decision making as it can influence the decisions of a broad spectrum of users of business information if it is recognised, measured, communicated and understood.

These assumptions are necessary in the research because the construct of flexibility is not well researched and there is a lack of conclusive evidence that could support these underlying assumptions. The assumptions form the base for the development of a definition of flexibility.

Defining flexibility

Several definitions and explanations of flexibility are proposed in the relevant literature. Ansoff (1965) is one of the earlier authors that attempted to define the concept of flexibility. He described two types: External and internal flexibility. External flexibility is considered to be the positioning of the organisation by "not putting all one's eggs in a single basket", whereas internal flexibility is seen as "seeking to provide a cushion in response to catastrophe". Both types are used by the management of organisations to deal with uncertainty, unforeseen change, contingency and catastrophe (Ansoff, 1965:55).

Volberda (1998:30) identifies a similar classification, but views internal flexibility as the capacity of organisations to adapt to the demands of the environment, while external flexibility is the capacity of organisations to influence their environment and thereby reduce their vulnerability. This distinction suggests that organisations do not only respond to but also influence their environment, a view that emanates from system theory. Ittner and Kogut (1995:155) contend that flexibility implies an increase in an organisation's ability to respond to a changing and uncertain environment. They suggest that flexible organisations do not shield themselves from uncertainty and change, while inflexible organisations are structured to buffer themselves from uncertainty in order to minimise risk.

The Financial Accounting Services Board (FASB) (1980:i) defines financial flexibility (a category of flexibility) as:

> *"... a measure of the adaptability of a business. The need for adaptability may be offensive or defensive. A business may need financial flexibility to take advantage of an unexpected new investment opportunity or to survive a crisis resulting from a change in operating conditions".*

The definition appears somewhat circular as it merely replaces one elusive term, flexibility, with another, adaptability. It does emphasise the main benefits of flexibility namely to exploit future opportunities and avert future threats. Several definitions of flexibility tend to focus only on threat and catastrophe, i.e. on its negative side.

Kanter (1982:197) suggests that flexibility is an organisational variable rather than a purely individual variable and that organisational conditions such as structure and culture can be used to create and stimulate flexibility. In contrast, Gabor (1969:333) and Pasmore (1994:6) contend that flexibility is an individual variable and that it is not organisations that are flexible or inflexible, but rather the people in them. Volberda (1998:3) suggests that it is both an organisation and an individual variable that has technical, managerial, organisational and human resource implications and that it is management's responsibility to create flexibility.

Notwithstanding the many, often conflicting, definitions of flexibility, it is acknowledged in the relevant literature that flexibility is poorly understood and that researchers are currently still exploring the meaning of the term. Flexibility has been called a complex, multidimensional and elusive term (Volberda, 1998:2, Parthasarthy & Sethi, 1992:96). Any attempt to develop a clear and concise definition of the construct destroys some of its essence i.e. the construct itself becomes less flexible (Koornhof, 1999:21). To improve the visibility and awareness of the construct and to measure it, a definition of flexibility is attempted, notwithstanding the constraints mentioned. The following *definition* of flexibility is used [a modified version of a definition proposed by Donaldson, (1971:8)]:

> *"Flexibility is the ability and capacity to reposition resources and functions of the organisation in a manner consistent with the evolving strategy of management as they respond, proactively or reactively, to change in the environment" (Koornhof, 1998:138).*

The above definition addresses a number of weaknesses identified in the definitions within the literature. It assumes that flexibility is both an organisational and an individual variable. It encompasses the operational, financial, strategic, marketing, manufacturing and behavioural aspects of flexibility. It recognises, from an open system perspective, the dynamic relationship that exists between the organisation and its environment. It recognises that management is responsible for the creation and enhancement of flexibility in their enterprises. The change in the environment refers to both future threats and to opportunities. The ability and the capacity to reposition the organisation refers to the inclination of management of flexible organisations not to shield themselves from uncertainty and risk, but rather to reduce vulnerability by actively influencing the environment.

Developing a flexibility framework

When the concept of flexibility is defined, the research area is simultaneously demarcated. It then becomes possible to attempt to articulate a conceptual framework that captures the nature and constituents of the concept. A conceptual framework of the theoretical and practical aspects of flexibility that can assist management to assess actual flexibility and to create more flexibility in response to environmental change.

The purpose of this article is to propose a framework for flexibility in enterprises that can also serve as a basis for the development and measurement of flexibility. The categories selected in such a framework should be clearly identified, produce a consistent classification and be amenable to measurement. In the majority of the literature and research on frameworks for flexibility, a functional approach is adopted. This means that some functions within the organisation, such as production flexibility, (Johnson, 1992; Abernethy & Lillis, 1995), financial flexibility (Donaldson, 1971; Heath, 1978; Koornhof, 1988) and marketing flexibility (Harrigan, 1985) is used as the basis of classification. Aaker & Mascarenhas (1984:75) suggest that the various functions of an organisation form a suitable basis for developing of a classification framework for flexibility. This basis for the identification of categories of flexibility is adopted to identify the following six categories (refer to figure 1):

- *Production flexibility* is the flexibility that organisations gain through the input, processing and output of goods and services (it encompasses manufacturing flexibility);
- *Marketing flexibility* is the ability to enter or exit markets, to open and close businesses, to introduce new products and services and phase out others;
- *Financial flexibility* is the ability of an enterprise to take effective actions to alter the amount and timing of future cash flows so that it can respond to unexpected needs and opportunities;
- *Informational flexibility* refers to the ability to change the information system to meet the shifting needs of users of information quickly and cost effectively, without forfeiting quality and integrity;
- *Geographical flexibility* refers to the options available to multinational companies to shift profits and business operations between countries to exploit favourable tax regimes, labour laws, exchange rates, etc.
- *Human, cultural and organisational flexibility* refers to flexibility in management and employees, in the corporate culture and in organisational structure.

Of the six selected categories, the first five are based on a functional approach, viewing flexibility as an organisation variable. The last category is derived mainly from an actor approach, which focuses on the traits and qualities of people and organisations that are flexible (Kanter, 1982; Pasmore, 1994; Volberda, 1998). This approach views flexibility as an individual and organisation variable. This last category is also the broadest category. It encompasses at least three fields that are of a qualitative nature and difficult to measure. It is for this reason that only one category is created. Each of the categories can be divided into subcategories. For example, Gerwin (1993:398) suggests that production flexibility consists of six subcategories: mix, changeover, modification, volume, rerouting, material flexibility.

The proposed classification framework does not attempt to reflect all the complexities of reality. It is an abstraction or simplification of reality and the categories are not necessarily mutually exclusive and they interact with each other. To illustrate, production flexibility may be constrained by a lack of financial flexibility, while increased production flexibility may encourage and complement marketing flexibility. These categories of flexibility can also conflict with each other. In other words, there are + and – forces at work helping or impeding flexibility across functions. Assume that a company has used all its available lines of credit and it has to sell machinery to raise the funds it requires. A gain in financial flexibility may be at the cost of capacity and production flexibility, which may in turn have an adverse effect on marketing flexibility. Gerwin (1993:398) suggests that management should develop their *flexibility responsiveness,* which is the ability to coordinate, integrate and switch among flexibility categories.

Ansari, Bell, Klammer & Lawrence (1997:TC-1) suggest that there are three strategic aspects namely quality, cost and time, in respect on which all organisations compete simultaneously in production. The quality aspect refers to the customer's experience of the product; the cost to the resources expended to create the product or service; while time refers to the speed with which the products or services are supplied. Slack (1988) identifies another strategic aspect, namely range. A production unit is more flexible if it can deal with a wider range of possibilities or options. These strategic aspects do not, however, apply only to a production environment, but to all functions in the organisation in which flexibility can be created. Flexibility arises from the ability to outperform competitors in respect of these four strategic aspects. The six categories, four strategic aspects and their interactions are illustrated in Figure 1.

Strategic aspects

Categories of flexibility	Quality	Cost	Time	Range
Production				
Marketing				
Financial				
Informational				
Geographical				
Human, cultural and organisational				

Figure 1: A classification framework of flexibility

To illustrate the use of the framework, the following examples of flexibility that may be created in some of the categories, is provided:

- The production/range area refers to the ability of organisations to switch from one product to another or to provide product variation (Abernethy & Lillis, 1995:242), or refers to the maximisation of differentiation (Partasarthy & Sethi, 1993:531). A flexible company in this area of flexibility will typically have a range of products available with the ability of switch between products more effectively than its competitors. The cost efficiency of such changeovers refers to the production/cost category, while the speed at which the changeover is affected relative to competitors, refers to the production/time category. The production/quality area refers to the ability to maintain or improve quality while switching between products or changing product design.

- The geographical/range area refers to the options available to management, because the enterprise operates in more than one country. The higher the number of options (influenced by number of countries the enterprise operates in or can feasibly operate in and the degree of volatility between these countries), the higher the geographical/range area of flexibility (Muralidhar, 1992:136). The geographical/cost area refers to the ability to shift operations, markets, etc. more cost effectively than competitors, while the geographical/time area is the ability to move between countries faster than competitors. Finally the geographical/quality area addresses the ability to switch between countries while maintaining or improving the quality of products and services.

In these examples it appears that the greater the number of options available to management in dealing with uncertainty, the greater the flexibility of the organisation. This statement probably holds true only to a point at which excessive options and an inability of management to manage and exploit such options may cause the organisation to revert to rigidity or chaos (Volberda, 1998:250). Managers should therefore develop flexibility responsiveness, the ability to coordinate, integrate, balance, choose and switch between flexibility categories.

Once management has identified the areas (categories and aspects) in which flexibility should be attained, these areas should first be measured and then assessed in relation to a benchmark. The performance of competitors could serve as a benchmark, although the company's own flexibility in prior years, the strategic goals set by management or sector indicators could also be used.

Measuring flexibility

Gerwin (1993:397) contends that the issue of flexibility arises when a formal decision is taken because it will affect the organisation's future options. In other words, the decisions taken on flexibility in the present will impacts on the options that management will have available in the future to respond to uncertainty and competition. Flexibility is therefore future-oriented, and as the future is unknowable (Stacey, 1992:7), particular problems arise in the measurement and reporting of this type of information. Gerwin (1993:401) suggests that, as a consequence of the complex nature of the construct, analytical models are proposed that are often difficult to implement unless restrictive assumptions are made. This may result in the exclusion of some important attributes of flexibility. For example, consider the use of finance options theory to value flexibility purely in terms of available call and put options. The options available to management do not only arise from a straight put or call option, but also from the option to defer action; the option to gradually build a position; the option to expand, shut down or restart; the option to abandon operations; the option to switch between alternatives; the option to grow organically or artificially through takeover and mergers; or any combination of the aforementioned options as is common in most real-life projects (Trigeorgis, 1993:203). In this context, options theory is a particularly restrictive measurement model, which fails to recognise important attributes of flexibility. Flexibility is not derived from options only. It could also reside in the minds/attitudes of management and employees and be driven by a corporate culture that promotes flexibility.

In an attempt to reduce the loss of important variables in the measurement of flexibility, the approach adopted in this article is to develop a framework of the various categories and aspects of flexibility. The management of an organisation should identify those areas of the framework in which flexibility should be created/improved. To successfully identify areas of flexibility, management should exercise flexibility responsiveness. Managers should have the ability to identify interrelationships between categories; recognise the drivers of flexibility; and coordinate, integrate and change between flexibility categories, where necessary. Once the categories are established, the performance in these categories can be measured.

This research suggests that in attempting to measure flexibility, it is necessary to identify three *levels* of flexibility (adapted from Gerwin, 1993:402-403):

- *Required flexibility* (RF) which is the predetermined level of flexibility that a business organisation should achieve. It is derived from benchmarking competitors or potential competitors, from performance in prior years or from strategic goals.

- *Actual flexibility* (AF), which is the level of flexibility that is currently achieved in the company or, stated differently, the status quo in the organisation.

- *Potential flexibility* (PF), which refers to the unused and potential flexibility residing in the organisation and which management can harness in a relatively short time span.

Of the three, potential flexibility is most important when the organisation is operating in a turbulent environment.

The following combinations of the above levels of flexibility may arise, requiring the actions stated:

Position	Action
AF ≥ RF	Usually no action required unless strategic repositioning is required.
RF > AF	Investigate PF to establish whether further flexibility may be generated so that progress is made towards RF ≤ AF + PF
RF > AF + PF	If AF and PF are not sufficient to meet RF, internal restructuring or reengineering may be required.

Figure 2: Levels of flexibility

In developing flexibility indicators, management should use the classification framework proposed in Figure 1. Each area of flexibility for which indicators are developed, has a required level of flexibility. This level is usually obtained by screening the environment. It may also originate from targets set by management. The actual level of flexibility is obtained by analysing the conditions and capabilities within the organisation. The potential level of flexibility is that which is not currently being utilised or which may be created/accessed almost immediately. The required level of flexibility serves as the benchmark against which the actual and potential flexibility is compared to identify areas in the organisation in which greater flexibility should be created. The organisation gains competitive advantage through flexibility in each of the categories by outperforming competitors in respect of the four strategic aspects of quality, cost, time and range. The strategic objectives determine the type of flexibility indicators that are developed and in return influences the performance objectives.

The proposed framework and levels are tools that management can use to translate their flexibility requirements into performance objectives and, finally, into flexibility indicators. It should be emphasized that flexibility seldom, if ever, allows for direct measurement of the phenomenon. Instead surrogates that are indicative of flexibility in an organisation, are used. For example, a surrogate for the measurement of the marketing/range category may be the number of markets that the company operates in, or may operate in, given its current portfolio of products, services and skills.

Management can use various procedures in the development of flexibility indicators. They procedures commence with the translation of the particular type of uncertainty with which management is dealing into strategic objectives that, in turn, determine certain flexibility requirements. These flexibility requirements are then translated into performance objectives that can be measured by means of flexibility indicators for actual, required and potential flexibility. These procedures, with examples that are applicable to the *production category*, are illustrated in figure 3. Similar procedures can be adopted in the development of flexibility indicators in each of the other five categories (Koornhof, 1998).

The problem with flexibility indicators

It is apparent that a large number of flexibility indicators can be developed. Enterprises should, however, limit the number, keep the calculations simple and make the indicators more visible to employees (Peters, 1991:326). 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.

A solution to the problem may be to use existing models of performance to identify key indicators. For example, the core competencies of organisations developed by Prahalad and Hamel (1990:82) could provide a feasible basis for selecting the most appropriate flexibility indicators for a particular enterprise. Core competencies result from collective learning in organisations, coupled with the ability to co-ordinate diverse production skills and to integrate multiple streams of technology. An enterprise that focuses on its core competencies, identifies itself as being a portfolio of skills rather than being a portfolio of business units (Wheatley, 1994:93). It is important that firms should focus on the areas in which they can surprise, outperform and outmanoeuvre competitors, rather than merely attempting to replicate that which competitors already do. It is suggested that flexibility indicators could be selected to support the enterprise's strategic initiatives and core competencies, because these will constitute its unique sources of competitive advantage. However, other models used in identifying key performance areas may also be suitable (e.g. balanced score card approach).

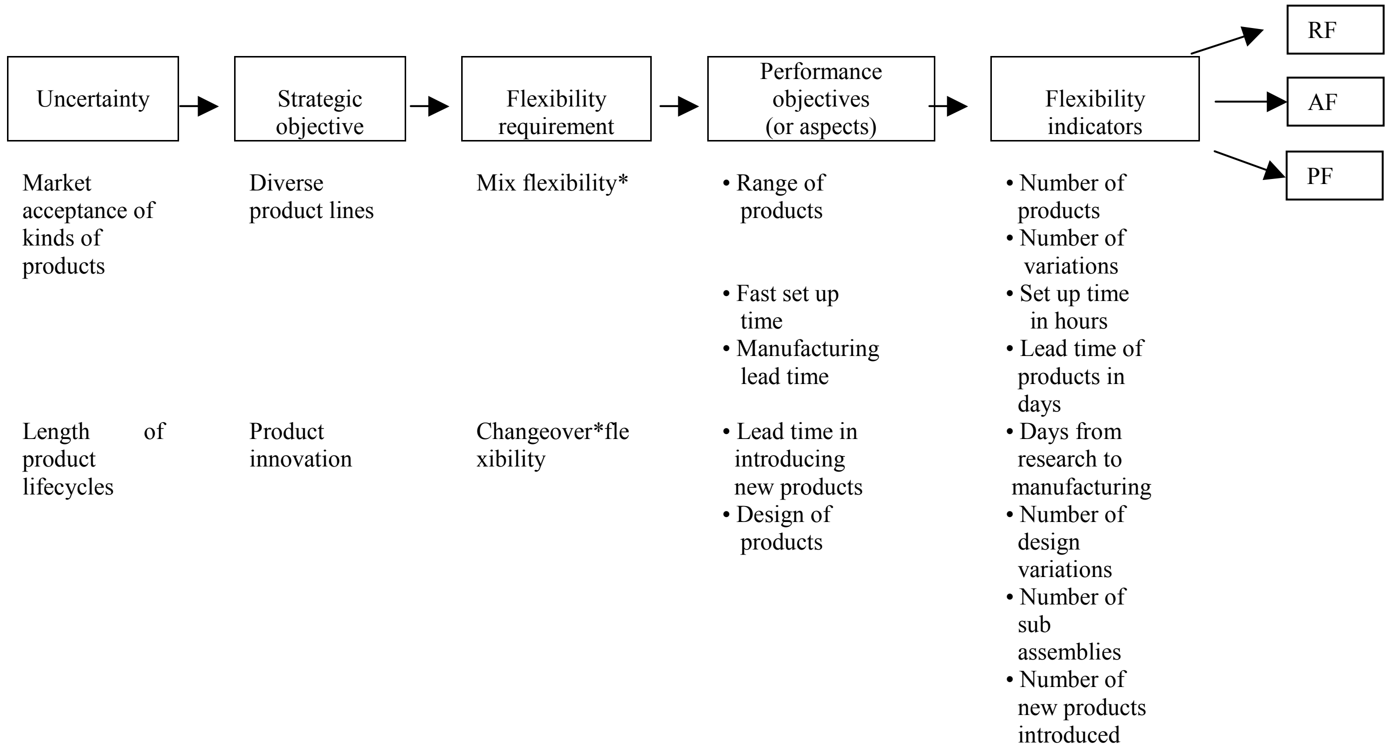

Figure 3: Development of flexibility indicators

* Mix and Changeover flexibility are subcategories of production flexibility. Mix flexibility is achieved through product diversity in product lines and variation to products. Changeover flexibility is the ability to quickly substitute new products while for existing ones.

Source: Adapted from Gerwin, D. 1993. Manufacturing flexibility: A strategic perspective, *Management Science*, **39**(4): 398.

Conclusion

The construct of flexibility has been observed in enterprises for a long period and the benefits to enterprises of being flexible have been described in the literature. Flexibility arises from the capability of management to actively adapt the organisation to accommodate change occurring in the environment, or to influence the environment so as to reduce its vulnerability to uncertainty. There is at present a lack of theoretical frameworks to guide management in the development of flexible organisations and there is limited guidance available on the measurement of flexibility in business enterprises. The development of the construct of flexibility along more formal lines permits management to explore the possibility of adding long-term value to an enterprise by creating and sustaining particular levels and areas of flexibility in response to uncertainty, competition and change in the environment.

This research defines the construct flexibility and proposes a conceptual framework that managers can use to create more flexible organisations. The framework can also be used to measure and manage flexibility indicators. Examples in respect of production and geographical flexibility are used to illustrate the use of the framework and levels of flexibility in the creation of indicators. Flexibility indicators can be used by management to measure current levels of flexibility; determine flexibility targets; to monitor progress in meeting targets; and signal direction in comparison with benchmark competitors.

However, the successful application of the conceptual framework on flexibility depends to a large extent on the willingness of managers to recognise its potential as well as the necessity of creating and sustaining greater flexibility in their organisations. Flexibility become visible in these organisations when it is both measured and managed. The introduction of flexibility management represents a fundamentally different set of managing and organising principles and a different way of conducting corporate life (Volberda, 1998:5).

Areas for future research

The development on a conceptual framework of flexibility provides a suggestion on how flexibility may be managed in organisations. The next stage of research would entail the testing of the framework in business organisations. The practical application of the framework may indicate that further refinements are required.

Research could also be conducted in the following areas of flexibility:

- The validation of the categories, levels and strategic aspects of flexibility through observation of the use of the construct in enterprises.
- The development of indicators of flexibility and testing of their usefulness in organisations.
- An observation of the influence of flexibility in decision making of management and other stakeholders in enterprises.
- A comparison of the flexibility levels in different companies and industries, possibly via the development of flexibility scales.
- The development of industry indicators of flexibility.
- The empirical testing of the relationship between certain flexibility indicators and stock market prices.
- The testing of the relationship between flexible and inflexible enterprises and their stock market prices.
- The relationship between multi-national enterprises and national companies and the impact of geographical flexibility on share prices.
- The use of information on flexibility by management and employees in strategic decisions, sensitivity analysis and in predicting future outcomes of the organisation.
- A historical overview of the progress of flexible companies compared to inflexible companies, to determine whether flexible companies
  - outperform inflexible companies;
  - are more likely to survive in a changing environment than inflexible ones.
- A study of the impact of flexibility on corporate failure and corporate recovery.
- A further refinement of the procedures proposed for developing, measuring and communicating flexibility measures.
- The identification of subcategories for each category of flexibility such as changeover, volume and rerouting flexibility in production flexibility.
- A refinement of the definition of flexibility.
- The development of more guidelines for the identification of potential flexibility.
- A study of the behavioural impact of flexibility and the development of defence routines.
- A survey to establish whether information on flexibility is used in decision-making.
- Further refinement on the measurement and valuation of flexibility.

References

Aaker, D.A. & Mascarenhas, B. 1984. 'The need for strategic flexibility', *The Journal of Business Strategy*, **5**(2):74-82.

Abernethy, M. A. & Lillis, A.M. 1995. 'The impact of manufacturing flexibility on management control system design', *Accounting, Organisations and Society*, **20**(4):241-258.

AICPA see American Institute of Certified Public Accountants.

American Institute of Certified Public Accountants. 1993. Disclosure of certain significant risks and uncertainties and financial flexibility. New York: The Institute. Exposure Draft.

Ansari, S.A., Bell, J., Klammer, T. & Lawrence, C. 1997. *Target costing*. Homewood, III: Richard D. Irwin.

Ansoff, H.I. 1965. *Corporate strategy.* New York: John Wiley.

Ansoff, H.I. 1988. *The new corporate strategy.* New York: John Wiley.

Boynton, A.C. & Victor, B. 1991. 'Beyond flexibility: Building and managing the dynamically stable organisation', *California Management Review*, **34**(1):53-66.

Burrell, G. & Morgan, G. 1979. *Sociological paradigms and organisational analysis: Elements of the sociology of corporate life.* London: Heinemann.

Churchman, C.W. 1961. *Prediction and optimal decision: Philosophical issues of a science of values.* Englewood Cliffs, NJ: Prentice-Hall, 394p.

Correia, C., Flynn, D., Uliana, E. & Wormald, M. 1993. *Financial Management.* Cape Town: Juta.

Donaldson, G. 1971. *Strategy for financial mobility.* Homewood, III: Richard D. Irwin.

Eppink, D. J. 1978. Managing the unforeseen: A study of flexibility. Unpublished Thesis. Amsterdam: Vrije Universiteit.

FASB see Financial Accounting Standard Board.

Financial Accounting Standard Board. 1980. Reporting funds flows, liquidity and financial flexibility. New York: The Board. Discussion Memorandum.

Gabor, D. 1969. ‘Open-ended planning’. **In** Jantsch, E. (Ed.). *Perspectives of planning*. Paris: OECD.

Gerwin, D. 1993. ‘Manufacturing flexibility: A strategic perspective’, *Management Science*, **39**(4):395-410.

Harrigan, K.R. 1985. *Strategic flexibility: A management guide to changing times.* Boston, Mass.: Lexington Books.

Heath, L.C. 1978. *Financial reporting and the evaluation of solvency.* New York: American Institute of Certified Public Accountants.

Hendriksen, E.S. & Van Breda, M.F. 1992. *Accounting theory*. 5th Edition. Boston, Mass.: Richard D. Irwin.

Hopper, T. & Powell, A. 1985. ‘Making sense of research into the organisational and social aspects of management accounting’, *Journal of Management Studies, 22*(5):429-465.

Ittner, C.D. & Kogut, B. 1995. ‘How control systems can support organisational systems’. **In** Bowman, E. & Kogut, B. (Eds.). *Redesigning the firm.* New York: Oxford University Press.

Johnson, H.T. 1992. *Relevance regained: From top-down to bottom-up empowerment*. New York: The Free Press.

Kam, V. 1990. *Accounting theory.* 2nd Edition. New York: John Wiley.

Kanter, R.M. 1982. *The change masters: Corporate entrepreneurs at work.* London: George Allen & Unwin.

Kogut, B. 1985. ‘Designing global strategies: Profiting for operational flexibility’, *Sloan Management Review*, **27**(1):27-38.

Koornhof, C. Winter 1988. ‘Financial flexibility and the assessment of future cash flows’, *The Investment Analyst Journal*, **31**:13-10.

Koornhof, C. 1998. Accounting information on flexibility. Unpublished DCom thesis. Pretoria: University of Pretoria.

Koornhof, C. 1999. ‘How flexible is your company?’ *Accounting and Finance Update*, **5**(2): 21-23.

Mitroff, I.I., Betz, F., Pondy, L.R. & Sagasti, F. 1974. ‘On managing science in the systems age: Two schemes for the study of science as a whole systems phenomenon’, *Interfaces*, **4**(3):46-58.

Muralidhar, A.S. 1992. Volatility, flexibility and the multinational enterprise**.** Unpublished DPhil thesis. Boston, Mass.: Massachusetts Institute of Technology.

Nadler, D.A. & Shaw, R.B. 1995. ‘Change leadership: Core competency for the twenty first century’. **In** Nadler, D.A., Shaw, R.B. Walton, A.E. & Ass. (Eds.). *Discontinuous change: Leading organisational transformation*. San Francisco: Josey Bass.

Parthasarthy, R. & Sethi, S.P. 1992. ‘The impact of flexibility automation on business strategy and organisational structure’, *Academy of Management Review*, **17**(1):86-111.

Parthasarthy, R. & Sethi, S.P. 1993. ‘Relating strategy and structure to flexible automation: A test of fit and performance implications’, *Strategic Management Journal*, **14**(7):524-549.

Pasmore, W.A. 1994. *Creating strategic change, designing the flexible high performance organisation.* New York: John Wiley.

Peters, T. 1991. *Thriving on chaos: Handbook for a management revolution.* New York: Harper Perennial.

Prahalad, C.K. & Hamel, B. 1990. ‘The core competence of the corporation’, *Harvard Business Review*, **68**(3):79-91.

Puxty, A.G. 1993. *The social & organisational context of management accounting.* London: Academic Press. The Chartered Institute of Management Accountants Publication.

Slack, N. February 1988. ‘Manufacturing flexibility: An assessment procedure’, *Computer-Integrated Manufacturing System*, **1**(1):25-31.

Stacey, R.D. 1992. *Managing the unknowable: Strategic boundaries between order and chaos in organisations.* San Francisco: Jossey-Bass.

Steers, R.M. 1975. ‘Problems in the measurement of organisational effectiveness’, *Administrative Science Quarterly,* **4**(20):546-558.

Trigeorgis, L. 1993. ‘Real options and interactions with financial flexibility’, *Financial Management*, **22**(3):203-224.

Upton, D.M. Winter 1994. ‘The management of manufacturing flexibility’, *California Management Review,* **36**(2):72-89.

Volberda, H.W. 1998. *Building the flexible firm: How to remain competitive.* New York: Oxford University Press.

Wheatley, M.J. 1994. *Leadership and the new science: Learning about organisation from an orderly universe.* San Francisco: Berrett-Koehler.