Managing Intangible Assets: Are Presently Available Measures Useful?

*Antti Lönnqvist**

Abstract

This paper examines the usefulness of performance measures presently available for managing intangible assets. The usefulness of performance measures is assessed based on a case research in three organisations. In the empirical examination the experienced usefulness of measures and the quality of the measures used were evaluated. The results show that some performance measures seem very effective and useful while some do not. The practical usefulness depends on situation specific issues. Objective measures describe the factors being measured narrowly and could thus be invalid and irrelevant. Subjective measures capture the different aspects of intangible assets but interpreting their results could be problematic. Based on the results of this study, organisations should be encouraged to utilise the performance measures presently available in the literature for managing their intangible assets. In specific situations the measures are considered useful and effective. Even if the measures are considered to be functioning poorly, they may still be useful in guiding activities and that they can likely be improved based on the experiences in using the measures.

Keywords

Intangible Assets;
Intangible Success Factors;
Intellectual Capital;
Measurement;
Performance Measures;
Usefulness of Measures

* Tampere University of Technology, Institute of Business Information Management

Introduction

The management of an organisation's intangible assets (or intellectual capital) is a challenging task. According to Lev (2001, p. 7), "intangible assets are non-physical sources of value (claims to future benefits) generated by innovation (discovery), unique organisational designs, or human resource practices". Performance measurement is a practical tool that can help managers (and management accountants) deal with intangible assets. A significant amount of research has been carried out on the measurement of intangible assets during the recent decade. However, measurement of intangible assets is still considered quite difficult to carry out in practice. Despite the problems, there are a number of performance measures of intangible assets presented in the literature and it seems that many organisations are also applying them in practice (see for example, Mouritsen et al., 2003; Ratnatunga et al., 2004).

Currently, there is very little experience on how different organisations are using performance measurement to manage their intangible assets and whether managers consider the measures they are using useful. Although we can assume that there are some problems in application, there is a lack of research evidence in this area. Studying not only how performance measures can be designed but also how the measures are used in practice might provide new insights, which would make it possible to develop more useful measures in the future. Thus, the issue is highly relevant to managerial practice.

This paper examines the usefulness of performance measures presently available for managing intangible assets. In this paper, the concept *intangible success factors* is used to refer to individual intangible assets and also the activities related to improving or utilising the assets, i.e. any intangible phenomena that are to be measured. The purpose of the paper is to assess the usefulness of the presently available performance measures of intangible success factors. *Usefulness* is assessed using three approaches: First, the

measures presented in the literature are evaluated by reviewing and analysing the literature on performance measurement, intangible assets and human resource accounting.

Second, the usefulness of measures of intangible success factors used in practice in three organisations is examined from the point of view of the users of the measures.

Third, the quality of these measures is assessed based on how well they can cover the different intangible success factors originally intended to be measured. The empirical examination has been carried out as case research.

The method will be described more thoroughly later.

Measurement of Intangible Success Factors

An organisation's intangible assets consist of such things as employees' competencies, organisation's relationships with customers and other stakeholders, its culture, image and management processes (see Edvinsson and Malone, 1997; Sveiby, 1997). In this paper the following definition is used:

> *Intangible assets consist of the non-physical sources of value related to employees' capabilities, an organisation's resources and way of operating and the relationships with its stakeholders (Lönnqvist, 2004).*

The term intellectual capital is considered a synonym. Table One shows a classification and examples of typical intangible assets.

Table One: Intangible Assets of an Organisation.

Human Assets	Relational Assets	Structural Assets
• Knowledge and competencies • Experience • Education • Creativity, innovativeness • Other properties (e.g. leadership, entrepreneurship)	• Relationships with customers and other stakeholders • Contracts and arrangements with stakeholders • Organisation's image and brands	• Technologies • Information systems • Data bases • Processes • Culture and values • Management philosophy • Patents, copyrights, trade secrets, and other immaterial properties
Source: Mettänen, 2002		

According to Marr et al. (2003), the main causes for measuring intangible assets arise due to specific internal and external factors.

This paper examines the *internal* management purposes, which include strategy formulation, strategic management, benchmarking, compensation and motivation. *External* factors include the valuation of stock price and raising capital. According to Dion (2000), the internal causes for measuring intangible assets include the following:

- to balance against well-established financial measures,
- to monitor the ability to innovate,
- to align resources with and execute strategy,
- to improve knowledge worker productivity and
- to improve operational excellence.

There are several methods available for measuring intangible assets. Luthy (1998) divides the methods into two basic groups:

component-by-component and *organisational-level* measurement methods.

Component-by-component methods identify individual components of intangible assets (e.g. culture or employees' competencies) and measure them. An example of these methods is the Intangible Assets Monitor (Sveiby, 1997).

Organisational-level measurement methods include methods such as Market-to-Book ratio, Tobin's q, Calculated Intangible Value and Intangibles Scoreboard (see for example, Andriessen, 2004). In this paper, the main focus is on the component-by-component methods. Thus, the measurement methods that are designed to be used in managing intangible assets at business unit or department levels will be discussed and also applied to practice in the case organisations.

When intangible assets are considered from the point of view of measuring and managing organisation's performance it is important to focus also on the activities that are carried out in relation to the assets (see Danish Agency for Trade and Industry, 2000 and Meritum, 2001). Therefore, it would be convenient to have a single concept that could be used when discussing the objects of measurement, regardless of whether they are intangible assets or activities related to them.

Further, in component-by-component type measurement of intangible assets, individual assets (e.g. the factors listed in Table One) are measured (Luthy, 1998), i.e. the aim is not to measure the amount or value of intangible assets of an organisation as a whole. Within performance measurement literature the individual objects being measured are usually called success factors. Thus, the term intangible success factors can be used to refer to both intangible assets and the activities related to improving or utilising the assets.

As a managerial practice, the measurement of intangible success factors is still quite a new area. In fact, there are several problems and confusions regarding what should be measured and how such measurements should be done. Many organisations consider the measurement of intangible success factors important but lack the tools for carrying it out in practice (Dion, 2000; Neely et al., 2002). For example, collecting the necessary data has been considered difficult because of the intangible nature of the factors being measured (Lönnqvist and Mettänen, 2005).

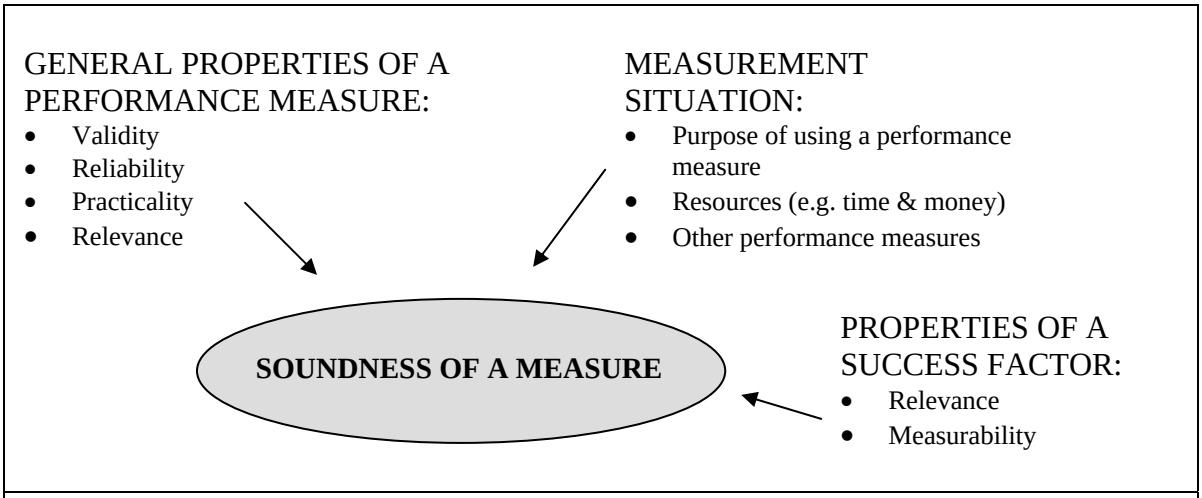
Recent studies have shown that it is possible to design and implement certain measures of intangible success factors to organisations (see e.g. Mouritsen et al., 2003). There are also a number of possible measures presented in the literature (see for example, Edvinsson and Malone, 1997; Liebowitz and Suen, 2000; Mouritsen et al., 2003; Ratnatunga, 2002). However, there is only a limited amount of experiences regarding the use of these measures. Thus, it is still unclear whether the measures of intangible success factors are considered useful in practice.

Criteria for Assessing the Soundness of Performance Measures

Performance measures should meet certain criteria in order to be considered sound, i.e. managerially useful and "good". Soundness refers to both the objective quality and the experienced value of a measure in the particular context of usage.

A summary of factors affecting the soundness of a performance measure is presented in Figure One. The presentation is not comprehensive. However, it illustrates that there are different elements that should be considered when assessing the soundness of a performance measure in practical situations.

Figure One: Factors Affecting the Soundness of a Performance Measure.



Source: Lönnqvist, 2004

There are at least four general criteria of sound measures (Emory, 1985; Hannula, 1999). First, a measure should be *valid*, i.e., it should measure the factor it is intended to measure. Second, a measure should be *reliable*, i.e., it should be free of random error. Third, a measure should be *relevant*, i.e., the person using the measure should consider it important. Fourth, a measure should be *practical*, i.e., the cost of measurement should be in relation to the benefits received.

It should be noticed that the general criteria of sound measures are not absolute. In practice, performance measures are compromises between different criteria (see Uusi-Rauva and Hannula, 1996). For example, improving validity and reliability may result in increasing the cost of measurement. Thus, the optimal solution must be assessed as a compromise between the accuracy of the measurement result and the cost incurred. In fact, the general criteria of sound measures may have to be considered against factors related to the specific situation. For example, different organisations have different amounts of financial resources to be used for measurement.

In addition to the general criteria of sound measures described above, the purpose of measurement is another important factor in assessing the soundness of measurement in a particular case (Lönnqvist and Mettänen, 2005). A common example is the different criteria used for cost information by authorities and by product costing systems (Johnson and Kaplan, 1987). When measures are used primarily for decision-making, controlling and communication outside the organisation, the measurements must be exact. In other words, validity and reliability are most important when exact quantification is needed. When measures are mainly used to guide or teach employees, the measurements do not necessarily have to be exact. It is more important that the measure focuses employees' attention on the right issues. Thus, validity and reliability are not as important as they are when a measure is used for exact quantification.

Also the managerial relevance of the success factor being measured may affect the way the criteria of measures are assessed. If a factor is considered essentially important and information related to the factor is required, a measure with less than optimal properties may have to be accepted if better options are not available. For example, although indirect performance measures have poor validity they are still used quite often because they can provide some information regarding an important phenomenon that otherwise could not be described at all (Kaydos, 1999).

Quality of Performance Measures Presently Available

A significant amount of literature is available pertaining to the measurement of intangible assets (see for example, Ratnatunga, 2002; Andriessen, 2004; Marr and Chatzkel, 2004:). In this section measures presented in the literature on performance measurement, intangible assets and human resource accounting are evaluated briefly.

Performance Measurement Literature - A Brief Review

Some of the measures of intangible success factors have been used for years as a part of the normal performance measurement of companies. These measures also include employee and customer satisfaction indices (see Kaplan and Norton, 1996; Neely, 1998; Uusi-Rauva, 1996). However, these latter measures are usually considered non-financial measures, not necessarily as measures of intangible success factors. For example, Kaplan and Norton (1996) discuss measuring both financial and non-financial factors. Thus, although not mentioned as such, intangible success factors such as customer satisfaction and competencies, are also considered an important part of the Balanced Scorecard (Kaplan and Norton, 1996). Similar features are also included in other balanced performance measurement frameworks such as that proposed by Tuomela, 2000.

Intangible Assets Literature - A Brief Review

The strength of the intangible assets research field is that there is a vast amount of measures that can be used and further developed. However, some of the measures seem problematic. Some authors discuss the measures of intangible success factors as indicators that relate to a certain theme rather than to any specific success factor. For example, according to Hannula et al. (2002), all the following measures are related to '*committed and stable personnel*': average age of employees, the amount of employees over fifty years, the amount of temporary employees in relation to permanent employees and the amount of employees with less than two years of experience.

The multitude of measures that essentially measure the same thing illustrates the difficulty of designing good measures of intangible issues. In other words, the measures can be defined in many ways. Some authors do not even distinguish between the factors being measured and the measures used. For example, Edvinsson and Malone (1997) present lists of indicators related to various aspects of intangible assets without discussing what factors need to be measured. This approach does not follow the typical logic in which specific success factors are first defined and then the measures are defined for them.

Human Resource Costing and Accounting Literature - A Brief Review

The literature regarding human resource costing and accounting also includes numerous measures of intangible success factors (see e.g. Becker et al., 2001; Strömmer, 1999). However, they are (naturally) almost exclusively related to human resources. Thus, they do not cover certain areas of intangible assets, e.g. relational assets and some structural assets such as patents. A positive aspect of the measures of intangible success factors discussed in the literature regarding human resource costing and accounting is that there is a lot of experience of the measurement in practice and that it has been studied for such a long time. Therefore, some of the measures, for example those related to personnel costs, have become quite standard.

Evaluating the Measures Found in the Literature

Table Two illustrates some of the measures of intangible success factors presented in the literature. The examples are collected from several sources (Ahonen, 2000, pp. 137 - 138; Becker et al., 2001, pp. 71-74; Edvinsson and Malone, 1997, pp. 151 - 155; Hannula et al., 2002, pp. 131 - 137; Kaplan and Norton, 1996; Mouritsen et al., 2003, pp. 68 - 72; Strömmer, 1999, p. 301; and The Measures Catalogue, 2003). They are classified into three groups according to

the type of intangible assets they are related to. In addition, the organisational level for which the measure is supposed to be best suited is suggested. Some of the measures are more suitable for use at company level than in smaller business units. The division used here is the same that has been used by Becker et al. (2001, p. 74).

Table Two: Performance Measures of Intangible Success Factors.

Intangible Success Factor	**Performance Measure**	**Most suitable organisational level of use *(Company [C] and/ or business unit [BU])***
Human Assets		
Education	Hours (h) or money (€) used for education per employee	C & BU
Employee competence	Percentage of employees with academic degrees (%)	C
Employee satisfaction	Employee satisfaction survey (%)	C & BU
Personnel costs	Personnel costs (€), personnel costs / total costs (%)	C & BU
Recruiting efficiency	Average cost of recruiting (€)	C (& BU)
Stability of personnel	Average duration of employment (years)	C & BU
Relational Assets		
Brand recognition	Brand recognition (%) based on a market survey	C
Customer loyalty	Average duration of a customer relationship (years)	C & BU
Close relationship with suppliers	Number of co-operation contracts (number)	C & BU
Customer satisfaction	Customer satisfaction survey (%)	C & BU
Delivery accuracy	Products delivered to customers on time (%)	C & BU
Global operations	Ratio of international and domestic sales (%)	C & BU
Structural Assets		
Development of processes	Process descriptions (number)	C (& BU)
Documented information	Share of reports in databases per all reports (%)	C & BU
Efficient employee feedback system	Frequency of employee feedback (e.g. number / month)	C & BU
IT support of knowledge flow	Number of electronic discussion groups	C (& BU)
Quality assurance of processes	Audits and self-evaluation activities (number / year)	C (& BU)
Utilization of information technology	Annual investments in information technology (€)	C & BU

As the examples presented in Table Two illustrate, although there is a significant amount of performance measures available in the literature, some of these seem insufficiently defined. They lack some practical descriptions, e.g., regarding how the information should be collected for the measure. Commonly, employee satisfaction is suggested to be measured using an employee satisfaction index (see for example Kaplan and Norton, 1996; Mouritsen et al., 2003). However, quite often there is little or no description of the way the index is calculated or the data collected. Most importantly, *there is a lack of reported experience regarding how the measures work in practice*.

There are some measures of intangible success factors that can be considered almost standard. Such measures are typically related to human resource costing and accounting (e.g. the hours or money used annually for education per employee). These general measures focus on quite specific and defined aspects of an intangible asset. It seems that the more intangible a factor is, the more likely it has to be tailored specifically according to the requirements of a particular measurement situation. Such issues include employees' competencies and company image. They also include situation-specific differences that affect the way the measurement is carried out. For example, when measuring employees' competencies, it should be decided which competencies and which employees, the measurement concerns.

Many of the measures suggested in the literature are very indirect. For example, the percentage of employees with academic degrees is suggested to be a measure of personnel's competence (Hannula et al., 2002). However, this is probably not a very valid measure of personnel's competence because there are so many other aspects of competence in addition to formal education, e.g. the type of education, other skills and so on. Thus, the relevance of such a measure for managers may not be very high. The problem might be remedied by using several indirect measures which might together provide valuable information about the factor. On the other hand, using several measures takes more resources, and interpreting results may be difficult.

Some measures of intangible success factors presented in the literature seem useless in certain situations. First, some measures are useful only at company level, not in smaller business units. Such measures include, for example, percentage of employees with academic degrees and brand recognition based on a market survey. In smaller units, some issues may be self-evident without making any specific measurements. For example, there may not be any need to measure the percentage of employees with academic degrees if everybody knows that there are two persons with such degrees in a (small) organisation.

Second, certain measures seem to be somehow related to intangible assets but the actual relationship is not clear. This results in a situation where it is difficult to make any decisions based on the measurement results. The number of managers and the number of female managers are examples of such measures (Edvinsson and Malone, 1997). They may reflect something about the intangible assets of an organisation. However, it would seem that there are managerially more important issues than the number of managers.

Despite the problems with some of the measures of intangible success factors, there are a number of such measures available in the literature that seem useful and have been utilised successfully in practice. Suitable measures should be chosen to fit the needs of the particular situation. Using them may require tailoring for the needs of a particular situation and not all measures are likely to be useful in each situation.

Examining the Usefulness of the Measures in Practice

Research Methods

The paper is based on qualitative case research. The author examined three

Finnish knowledge-intensive organisations during a period in which performance measures of intangible success factors were first designed; then implemented; and finally used in their operations. The case organisations are quite small, i.e. between a little over twenty and about forty-five persons in each unit that is measured. The examination took place during the spring 2002 and the fall 2003.

This paper utilises the data collected during the case research by analysing the usefulness of the measures designed and implemented. The analysis methods used will be described in detail in the following sections of the paper.

Three different research approaches were used to gain access to research data in all three organisations. The case research consisted of action research, interviews and a focus group. These different methods were used because three different issues (design, implementation and use of measures) were examined; and no single research method suited well to these different situations.

Action research was carried out because it could provide a good insight about the process of designing performance measures (see e.g. Gummesson, 2000). It offered an access to data while the author participated in the design process as a facilitator.

The researcher did not take part in implementing the measures. The employees of the case organisations carried it out by themselves. Thus, action research was not an option.

The follow-up meetings that were held in order to see how the implementation had proceeded offered a way for obtaining information about the implementation. The project group that participated in the 'measures design' project in each organisation was interviewed about issues related to implementation.

A meeting was held after implementing the measures where managers in the three case organisations had an opportunity to exchange experiences and ideas regarding performance measurement. This offered a good way to gain access to information regarding the use of performance measures.

The meeting was organised in the form of a focus group. A focus group is a type of group interview where the interviewees discuss with each other regarding certain themes that are given by the facilitator of the focus group (Morgan, 1997). The author acted as a facilitator of the event. This included moderating the discussion and presenting additional guiding questions when necessary. Other researchers documented the discussion. Personal interviews were also used to get additional information about using the measures.

Measures of Intangible Success Factors in the Case Organisations

The measures of intangible success factors designed in the case organisations are discussed below.

The intangible success factors have been chosen based on the organisations' business objectives and the performance measures have been tailored in each organisation to fit the particular situation. The logic of choosing the factors to be measured and defining the measures is similar to the Balanced Scorecard approach.

The intangible success factors that are measured can be related to all three main types of intangible assets – human assets, relational assets and structural assets (see Table One). Also both *activities*, (e.g. increasing competencies), and *assets*, (e.g. employee welfare), are measured.

The performance measure(s) related to each of the factors presented in Table Three are briefly described in Table Four, Five and Six.

Table Three: The Intangible Success Factors of the Case Organisations and the Three Main Types of Intangible Assets.

	Human assets	Relational assets	Structural assets
Alma Media	Employee competencies	Customer satisfaction	Work atmosphere
	Education		
Technology Industries of Finland	Increasing competencies	Quality of organisation's services	Work atmosphere
		Quality of consultant's work	Efficient use of employees' time
		Customer's learning during project	Improving risk management
Work Efficiency Institute	Employee welfare	Positive publicity	Effective distribution of work
	Increasing academic competency	Customer satisfaction, financers	Effective project management
	Increasing competencies	Customer satisfaction, users	Sharing knowledge between departments
		Internationalisation	

Table Four: Intangible Success Factors and Measures of Alma Media.

Intangible Success Factors	Performance Measures
Customer satisfaction	*Customer relationship questionnaire*: carried out once a year, includes 14 questions, operated by an external service provider
	Assessment of relationships with most important customers: based on telephone interviews of ten most important customers, assessment scale 4 – 10, repeated once a month
Work atmosphere	*Employee questionnaire*: carried out once a year by the business division
Competencies	*Guru ratio*: based on competence matrix tool, measures the percentage of key competencies possessed, "guru" refers to the highest level of competence on a scale of zero (no competence) to four (guru level)
Education	*Workdays per month used for education*: based on the work time report, reported monthly, covers formal courses and self-education

Table Five: Intangible Success Factors and Measures of Technology Industries of Finland.

Intangible Success Factors	Performance Measures
Quality of organisation's services	*Customer questionnaire*: sent to customers after each project, result is calculated as a mean of certain questions
Quality of consultant's work	*Assessment by project managers*: based on an assessment form, project manager makes the assessment at the end of each project, assessment is transformed into quantitative values
Work atmosphere	*Employee questionnaire*: a subjective survey is carried out once a year
Customer's learning during project	*Customer questionnaire*: based on the same questionnaire as the measure of Quality of organisation's services, result calculated as a mean of certain questions
Efficient use of employees' time	*Time used on project ideas that do not realise*: "wasted" time is calculated twice a year
Increasing competencies	*Percentage of employees who have reached personal development goals*: data collected during annual development discussions between a manager and an employee, measurement unit is a percentage
Improving risk management	*Percentage of projects using the risk management tool*: projects that use the new tool are counted and compared to the number of projects in total

Table Six: Intangible Success Factors and Measures of Work Efficiency Institute.

Intangible Success Factors	Performance Measures
Employee welfare	*Employee satisfaction index (questionnaire)*: ten questions, five-point Likert scale, the index is calculated annually as a mean of all the answers
Positive publicity	*Organisation's visibility in media (number of appearances)*: result is obtained by calculating the number of times the organisation's name is presented in certain media, operated by an external service provider
Customer satisfaction, financers	*Percent of satisfied customers (questionnaire)*: reported once a year, questionnaire used in the concluding meeting after each project, a mean of answers to six questions regarding each project is calculated
Customer satisfaction, users	*Percent of satisfied customers (questionnaire)*: questionnaire is sent to customers attached to publications, measurement result is calculated by the average percentage ratio of yes-answers in relation to all responses
Effective distribution of work	*Percentage of employees whose workload meets certain criterion*: based on a work time monitoring system, 50 – 80 percent of work time should be spent on projects
Effective project management	*Mean ratio, calculated based on project evaluation form*: subjective assessment on a scale of zero to four, calculated once a year

Co-operation between departments	*Amount of joint projects between departments*: number and monetary volume of joint projects are measured, reported once a year
Internationalisation	*Amount of employees having attended an international occasion*: reported annually, each employee reports his / her activities
Increasing academic competency	*Number of postgraduate credits*: carried out once a year, data is collected during the annual development discussions between manager and employee
	Number of postgraduate degrees: same as above
	Number of other degrees: same as above
Increasing other competencies	*Percentage of employees who have reached personal development goals*: data collected during annual development discussions between a manager and an employee, measurement unit is a percentage
	Investments on education: annual education expenses are calculated

A large share of the measures of intangible success factors in all organisations is subjective. Customer satisfaction or employee welfare questionnaires are typical examples of subjective measures. A questionnaire can be used to measure many aspects of these intangible factors. Objective measures, e.g. the number of appearances in media and the investments on education, typically focus on more concrete issues than the subjective ones.

Experienced Usefulness of the Measures

The experienced usefulness of the measures was examined using two methods – *interviewing* and the *focus group*. The interviews and the focus group provided supplementing information about the use of the measures. Interviews provided information that focused on assessing the properties of individual measures one by one. Focus group provided information about different types of measures and about other factors that were affecting the use of the measures of intangible success factors. The research material obtained using the two methods was analysed first separately, and later using a cross-method analysis. The findings are presented below.

The evidence from both research methods suggests that there are measures in all case organisations that were experienced as effective and useful, as well as measures that were considered to be functioning poorly. For example, at the Work Efficiency Institute, the measure of *Positive publicity* was not experienced as very practical or useful because it was considered too expensive in relation to the benefits perceived. On the other hand, at Alma Media, the measure 'Guru ratio' has been reviewed in various occasions, e.g. in strategy meetings, and it has been experienced as "vital" for the organisation.

The results suggest that subjective measures seem to capture well the intangible success factors. However, subjective measures may not always reflect the objective reality and they may lack the sophistication that would allow focusing on improvement. On the other hand, objective measures of intangible success factors may have problems with validity and relevance. Therefore, they may not be considered managerially relevant. However, the evidence from both methods suggests that, from the point of view of the experienced usefulness of a measure, more important than the format of the measure (e.g. whether it is objective or subjective) is that it provides valuable information for managers. For example, qualitative information, e.g. the open questions in questionnaires, was considered especially useful.

The empirical experiences from using objective and subjective measures support the earlier findings reported in the literature by Lönnqvist and Mettänen (2005) and Rastas and Einola-Pekkinen (2001): A subjective measure can have good validity because it can describe the underlying success factor comprehensively. For example, a questionnaire with several questions can capture the various aspects of an intangible asset. In comparison, objective measures may only be able to offer a narrow picture of the underlying intangible success factor. Thus, the content validity (i.e. how comprehensively the factor is described) of an objective measure may not be very good.

Based on the focus group, the measures of intangible success factors related to operational issues, i.e. issues relating to everyday activities were considered to be especially useful. The same measures, (e.g. the customer questionnaires) at Alma Media and Technology Industries of Finland, were identified as most useful also in the interviews. The measures describing the effects of activities, (e.g. 'Customer's learning during project', and the competencies of employees) were often more problematic than the measures relating to operational issues and, thus, not considered as useful.

Some of the measures of intangible success factors had generated actions although the measures were considered problematic in some way or the first measurement results had not even been calculated yet at the time of the study. This suggests that these measures have been useful as a tool for guiding activities. For example, the measure 'Number of joint projects between departments' at the Work Efficiency Institute had not yet been used actively. However, the management group had already set up two different teams for improving knowledge sharing between departments and also other activities had been carried out. This underlines the fact that measurement highlights the importance of the factor being measured (see for example Neely, 1998; Uusi-Rauva, 1996). Focusing attention on a factor may be enough to cause actions related to it. Therefore, an important success factor may be worth measuring even using a deficient measure if better possibilities are not available (Hannula et al., 2002; Stivers et al., 1998). This also suggests the quality of the information that the measures provide may not always be the main criteria for the usefulness of the measures. In the early phases of using a measure, it may be sufficient to have deficient measures that can later be improved.

At the time of applying both research methods, there was only a limited amount of experiences from using the measures. Thus, the assessment of the usefulness and the problems experienced was considered difficult to make. However, all organisations considered it important to be able to assess the usefulness of the measures in relation to resources used. That seems difficult to ascertain in practice but it is likely to become easier in the future when more experience from using the measures is gained.

Quality of the Measures

Usually, it is difficult to objectively assess the quality of performance measures. Many of the issues related to the soundness of measures are determined subjectively. These issues include the relevance and practicality of the measures. They cannot be judged without subjective assessment by managers. On the other hand, the objective qualities, mainly reliability and validity, are hard to determine. In fact, there are very few practical methods available for assessing these properties. For example, the method of construct validation relies on examining the relationships between measurement results of different measures in relation to the expected relationships between the factors that are measured (Cronbach and Meehl, 1955). Any statistical testing of the measurement results would require measurement data from several measurement periods. Even when the data is available, it is not easy to make conclusions because many issues change in the organisation and in its environment over time.

One way to assess the validity of the measures of intangible success factors is to examine how the final measures in use cover the intangible success factors first identified. This type of examination shows the collective validity of all the measures used. In practice, it is possible to examine the factors first identified, the measures designed, then implemented and finally used. The number of intangible success factors initially identified was higher in each organisation than the number of factors chosen to be measured (See Table Seven). This is due to deleting factors considered to be overlapping, or because some factors were considered too difficult to measure, or as a result of reconsidering the importance of some of the factors.

Table Seven: Number of Intangible Success Factors and Measures in Different Phases of Measurement.

	Alma Media	Technology Industries of Finland	Work Efficiency Institute	Total
Number of factors initially identified	6	10	16	32
Number of factors measured	4	7	10	21
Number of measures designed	5	7	13	25
Number of measures implemented	5	4	7	16
Number of measures that have led to actions	5	3	5	13

Table Seven shows that not all the measures designed were also implemented. The implementation seems more successful at Alma Media than in the two other organisations. However, many of the measures at Alma Media existed already before the implementation phase. Thus, the situations are not fully comparable.

The percentage of measures implemented was low at Technology Industries of Finland and at the Work Efficiency Institute because of difficulties with subjective measures, and problems in defining and implementing the data sources of the measures.

As Table Seven suggests, not all measures implemented have been actively used. This may be partly due to the fact that there has not yet been an opportunity for using the measures because the examination was done so soon after implementing the measures.

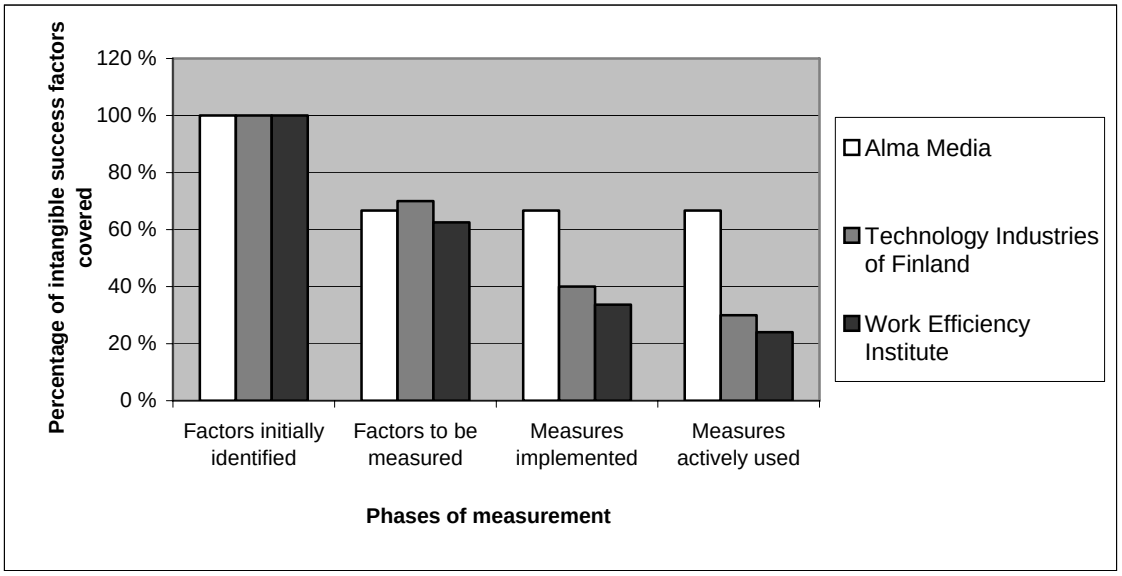
In some cases, the lack of active use seems to be also caused by problems with the measure, (e.g. the measure of *Positive publicity)*. On the other hand, some measures were reported to have led to actions even before they were fully implemented as described earlier in the paper.

Figure Two presents the coverage of the measures of intangible success factors in each organisation during different phases of measurement. The percentages have been calculated based on figures in Table Seven.

Figure Two suggests that only 34 – 67 percent of the intangible success factors could be measured with successfully implemented measures. In addition, the validity and reliability of the individual measures implemented cannot be ascertained.

Further, only 24 – 67 percent of the intangible success factors were managed using the measures implemented. Although this way of examining the collective validity of the measures is not precise, it can be stated that only a part of the important intangible success factors could be managed using the measures created in these three cases. Thus, the quality of the measures as a whole is not very good.

Figure Two: The Percentage of Intangible Success Factors Covered in Different Phases of Measurement.



Conclusions and Discussion

There are many different intangible success factors that can be measured and many ways to measure them. In addition to the properties of a measure as such, the experienced usefulness depends on the *situation* in which it is used, the *purpose* it is used for, and *user* of the measure. Thus, usefulness of measures is difficult to evaluate on a general level.

Based on the literature research, as well as the empirical examination undertaken, it can be stated that some of the measures used to manage intangible assets seem very useful and effective while some do not. Objective measures often describe intangible success factors narrowly and may thus have problems with validity and relevance. Subjective measures can capture the different aspects of intangible success factors but interpreting their results may be problematic. In addition, the use of subjective measures may be difficult in some cases just because of its very subjectivity. Subjective measures may not be credible (because often they are intertwined with behavioural issues) and they may not be otherwise useful in situations in which exact quantification is needed.

Not all of the important intangible success factors originally identified could be managed using the measures created in the case organisations, i.e. suitable measures could not be designed and implemented or the measures were not used for some reason. Many of the presently available performance measures of intangible success factors seem to be somewhat deficient – both those presented in the literature and those evaluated based on practical experiences. However, the results suggest that an important success factor might be worth measuring (even using a deficient measure) if better possibilities are not available. The results also suggest that the quality of the information that the measures provide might not always be the main criteria for the experienced usefulness of the measures – the fact that measurement guides activities is also important.

This research had two limitations that may have had an effect on the results. First, the empirical examination focused only on small organisations. It is possible that different issues regarding the usefulness would have been observed in larger organisations. Second, the case organisations had just recently designed and

implemented their performance measures. It is likely that different results would have been obtained if the examination had taken place later when the organisations would have had more experiences of using the measures. For example, it is possible that deficient measures had been improved or deleted and thus the experiences might have been more positive. On the other hand, the fact that the usefulness of measures was examined using different approaches, i.e. triangulation was used, increases the reliability of the results (see Yin, 1995).

Generalisation in case studies differs from that in statistical studies. The rhetoric of contextual generalization has been presented as a way to move from isolated results to a more general status (Lukka and Kasanen, 1995, p. 75). This means that the results of the study should apply in a context similar to that in which the case studies have been carried out. It is suggested here that the results could be applicable in situations that are within the limitations of this study, i.e. when measurement is used managerially and in small knowledge intensive organisations. It is unclear whether the results of this study have any value outside the context of this research setting. However, these results can be used at least as a starting point for further research dealing with the measurement of intangible success factors in different situations.

The practical implication of this study is that organisations can be encouraged to design measures of intangible success factors and to start using measurement to manage intangible assets. It is possible that many of the measured designed will be considered useful and effective in managing their intangible assets. In addition, those measures that are experienced as functioning poorly may still result in concrete activities and improvements. Further, the usefulness of the measures can likely be improved based on the practical experiences of using the measures.

Although there has been a lot of research on the measurement of intangible assets, the *use* of performance measurement for managing intangible assets has not received much attention. The contribution of this study is that it provides new empirical information about the issue. In order to be able to develop performance measures that will be experienced as useful in managing intangible assets, both researchers and practitioners in the field should test how the existing measures work in practice and continue to develop improved measures.

References

Ahonen, G. (2000), *Henkilöstötilinpäätös – yrityksen ikkuna menestykselliseen tulevaisuuteen* [Human resource statement], Kauppakaari, Helsinki.

Andriessen, D. (2004), "IC Valuation and Measurement: Classifying the State of the Art", *Journal of Intellectual Capital*, 5 (2), pp. 230-242.

Becker, B., Huselid, M., Ulrich, D. (2001), *The HR Scorecard. Linking People, Strategy, and Performance*, Harvard Business School Press, Boston, Massachusetts.

Cronbach, L., Meehl, P. (1955), "Construct Validity in Psychological Tests", *Psychological Bulletin*, 52, pp. 281-302.

Danish Agency for Trade and Industry (2000), *A Guideline for Intellectual Capital Statements – Key to Knowledge Management*, Copenhagen.

Dion, K. (2000), "Measuring Intangible Assets: The Internal Perspective", *Journal of cost management*, 14 (3), pp. 35-40.

Edvinsson, L., Malone, M. S. (1997), *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower*, HarperBusiness, New York.

Emory, C. (1985), *Business Research Methods*, 3rd Edition, The Irwin Series in Information and Decision Sciences, Homewood, Illinois.

Gummesson, E. (2000), *Qualitative Methods in Management Research*, 2nd Edition, Sage Publications, Thousand Oaks.

Hannula, M. (1999), *Expedient Total Productivity Measurement*, Acta Polytechnica Scandinavica, Industrial Management and Business Administration Series, No. 1.

Hannula, M., Leinonen, M., Lönnqvist, A., Mettänen, P., Miettinen, A., Okkonen, J. & Pirttimäki, V. (2002), *Nykyaikaisen organisaation suorituskyvyn mittaus* [Performance measurement in a modern organisation], Tampere University of Technology, Research reports 1/2002.

Johnson, T. H., Kaplan, R. S. (1987), *Relevance Lost. The Rise and Fall of Management Accounting*, Harvard Business School Press, Boston, Massachusetts.

Kaplan, R. S., Norton, D. P. (1996), *The Balanced Scorecard. Translating Strategy into Action*, Harvard Business School Press, Boston, Massachusetts.

Kaydos, W. J. (1999), *Operational Performance Measurement: Increasing Total Productivity*, CRC Press LLC, Boca Raton (FL).

Liebowitz, J., Suen, C. (2000), "Developing Knowledge Management Metrics for Measuring Intellectual Capital", *Journal of Intellectual Capital*, 1 (1), pp. 54-67.

Lukka, K., Kasanen, E. (1995), "The Problem of Generalizability: Anecdotes and Evidence in Accounting Research", *Accounting, Auditing & Accountability Journal*, 8 (5), pp. 71-90.

Luthy, D.H. (1998), *Intellectual capital and its measurement*, [http://www3.bus.osaka-cu.ac.jp/apira98/archives/htmls/25.htm], Visited 12.11.2002.

Lönnqvist, A. 2004. *Measurement of Intangible Success Factors: Case Studies on the Design, Implementation and Use of Measures*, Tampere University of Technology, Publication 475, Tampere.

Lönnqvist, A., Mettänen, P. (2005), "Criteria of Sound Intellectual Capital Measures", Business Performance Measurement: Intellectual Capital - Valuation Models, *Le Magnus University Press*, pp. 97-120.

Marr, B., Chatzkel, J. (2004), "Intellectual Capital at the Crossroads: Managing, Measuring, and Reporting of IC", *Journal of Intellectual Capital*, 5 (2), pp. 224-229.

Marr, B., Gray, D. Neely, A. (2003), "Why Do Firms Measure Intellectual Capital", *Journal of Intellectual Capital*, 4 (4), pp 441-464

Meritum. (2001), *Guidelines for managing and reporting on intangibles (Intellectual Capital Report)*. Final Report of the MERITUM Project.

Mettänen, P. (2002), *Tutkimusorganisaation menestystekijöiden ja mittareiden määrittäminen* [Defining the success factors and performance measures in a research organisation], Tampere University of Technology.

Morgan, D. L. (1997), *Focus Groups as Qualitative Research*, Second edition, Sage Publications, Qualitative Research Methods Series, Vol. 16.

Mouritsen, J., Bukh, N., Flagstad, K., Thorbjørnsen, S., Johansen, M., Kotnis, S., Thorsgaard Larsen, H., Nielsen, C., Kjærgaard, I., Krag, L., Jeppesen, G., Haisler, J. Stakemann, B. (2003), *Intellectual Capital Statements – The New Guideline*, Danish Ministry of Science, Technology and Innovation, Copenhagen.

Neely, A. (1998), *Measuring Business Performance. Why, What and How?* Profile Books Ltd, London.

Rastas, T., Einola-Pekkinen, V. (2001), Arvoa aineettomasta pääomasta [Value from Intangible assets], Tammi, Helsinki.

Ratnatunga, J. (2002), "The Valuation of Capabilities: A New Direction for Management Accounting Research", *Journal of Applied Management Accounting Research*, 1 (1), pp. 1-15.

Ratnatunga, J., Gray, N., Balachandran, K.R. (2004) "CEVITA^{TM}**:** The Valuation and Reporting of Strategic Capabilities", *Management Accounting Research*, 15(1) March, pp. 77-105.

Stivers, B. P., Covin, T. J., Hall, N. G., Smalt, S. W. (1998), "How Non-financial Performance Measures Are Used", *Management Accounting*, February, pp. 44 - 49.

Strömmer, R. (1999), *Henkilöstöjohtaminen* [Personnel management], Edita, Helsinki.

Sveiby, K.-E. (1997), *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*, Berrett-Koehler Publishers Inc, San Francisco.

The Measures Catalogue (2003), Created by the Centre for Business Performance, Cranfield School of Management, in conjunction with the Centre for Process Excellence, Andersen Consulting, Sample Version, [http://www.som.cranfield.ac.uk/som/cbp/], Visited 25.11.2003.

Tuomela, T.-S. (2000), *Customer Focus and Strategic Control*. A constructive case study of developing a strategic performance measurement system at FinABB, Turku School of Economics and Business Administration, Series D-2:2000.

Uusi-Rauva, E. (1996), *Ohjauksen tunnusluvut ja suoritusten mittaus* [Key indicators and performance measurement], Opetusmonisteita 2/96, Tampere.

Uusi-Rauva, E., Hannula, M. (1996), *Measurement – A Tool for Productivity Improvement*, 9th International Working Seminar on Production Economics. Innsbruck, pp. 13-29.

Yin, R. (1995), *Case Study Research: Design and Methods*, Second Edition, Applied Social Research Methods Series, Vol. 5, Sage Publications.