Classifying Controllers by Activities: An Exploratory Study

*Bernard H.J. Verstegen**
*Ivo De Loo**
*Paul Mol***
*Koos Slagter****
*Hendrik Geerkens*****

Abstract

The goal of this paper is to discern variables (triggers) that affect a controller's role in an organisation. Using survey data, groups of controllers are distinguished based on coherent combinations of activities. We find that controllers either operate as so-called 'information adapters' or 'watchmen'. Whether someone is bound to be an information adapter or watchman is mainly affected by personality traits and someone's experience in finance and accounting. This research can help to shape the controller function in organisations in such a way that the ensuing activities are manageable and do not contradict one another. Another contribution of this research is that an empirically informed framework that overcomes various conceptual disagreements in the literature is generated that can be used for the future testing of hypotheses.

Keywords

Controllers
Management Accountants
Classifications
Roles
Activities
Surveys

Introduction

Strategy formulation and strategy implementation are of great importance for an organisation. Although management bears chief responsibility for strategy, the organisation as a whole has to contribute to this activity at all levels. Management accountants or controllers as they are sometimes called, are among those involved in supporting and advising the management of an organisation on planning, control and decision-making issues during the strategy implementation processes (Anthony and Young, 2004; Atkinson, et al, 2004; De Loo et al., 2006). The way in which controllers play a part in this process has consequences for the way in which the strategy of an organisation unfolds.

In the past decades a substantial body of literature on controller roles has emerged (see Ahrens and Chapman, 2000; Friedman and Lyne, 1997; Granlund and Lukka, 1998; Hopper, 1980; Jablonsky and Barsky, 2000; Johnson, 1992; Kaplan, 1995; Kendall and Sheridan, 1991; Mouritsen, 1996; Riedijk, et al., 2002; Simon et al., 1954; Sathe 1982), albeit with little overall coherence. For example, Simon et al. (1954), being the first to look into the issue, distinguish scorekeeping, attention directing and problem solving roles.

Sathe (1982) classifies controllers as 'involved', 'strong', 'split' or 'independent' controllers, while Friedman and Lyne (1997) examine how far controllers can be regarded as 'bean counters'.

* Open University of the Netherlands
** Johnson Controls Bremen, Germany
*** Groningen University, The Netherlands
**** Erasmus University, The Netherlands

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Controller tasks, responsibilities, organisational position and the way in which they handle information are other research topics that can be found in the literature (Conijn, et al., 2003; Cooper, 1996a,b; Kaplan, 1995; Russell, et al, 1999; Sathe, 1982; Vaassen, 2002). Also, the characteristics and competencies needed to be a controller have been examined (Hunton, et al, 2000; Kendall and Sheridan, 1991; Russell, et al, 1999; Stone,et al., 2000; Sathe, 1982). In addition, groups of controllers have been distinguished and the differences between these groups have been analysed, albeit again with little conceptual agreement between authors (Ahrens and Chapman, 2000; Hopper, 1980; Jablonksy and Barsky, 2000; Riedijk, et al., 2002; Sathe, 1982). Empirical research has also highlighted the relative importance of variables affecting controllers' group membership (Ahrens and Chapman 2000; Caglio 2003; Cohen and Paquette, 1991; Hopper 1980; Hunton, et al., 2000; Knight 1982; van der Meer-Kooistra 1999; Mouritsen 1996; Russell, et al 1999; Sathe 1982; Stone, et al., 2000; Vaassen 2002). We could, for instance, imagine that education and training are important variables affecting a controller's functioning; that the financial position of the organisation is of importance, (as financial problems will direct a controller's attention to financial controls to a high degree); and that the organisational position of the controller is relevant, (as we might expect a concern controller to perform different activities than a plant controller).

In addition, there is research on the development path of the profession, for instance from scorekeeping to strategic control. Although the literature seems to suggest the existence of such a development path (Russell, et al., 1999), the question remains how far the profession has actually progressed. Are scorekeepers really becoming scarce or has the literature sketched a development that still has to materialize and should scorekeeping activities therefore still receive much attention from the management of an organisation (Friedman and Lyne, 1997)? Does the profession change as a consequence of the introduction and implementation of ICT-applications or not (Caglio, 2003; Friedman and Lyne, 1997)? Will developments in corporate governance relations drive groups of controllers apart? Will some groups disappear as a consequence of technological developments or as a consequence of new working conditions in organisations (Kendall and Sheridan 1991; Russell, et al., 1999)? These are just a few examples of the issues discussed in the literature.

Empirical knowledge is important for scientific purposes and for practice. When management is designing the financial function in an organisation it is important to consider the variables that significantly determine a controller's role and assign tasks to persons that match these. If distinct groups can be found a controller should not be assigned tasks stemming from various groups without realizing that it may be difficult to balance these. In Sathe's (1982) view only 'strong' controllers can function that way. Besides, in hiring the right persons for the specific activities controllers perform it is important to know the way in which personal characteristics influence a controller's functioning.

Although various empirically founded relationships are described in the literature these all highlight only a part of the complete picture. A problem is that very different definitions of controllers, controller roles and triggers are used. As a consequence it is difficult to get a coherent, complete picture of the controller's profession. This research aims to generate a comprehensive conceptual framework that is empirically informed. For these reasons, this paper contains, among other things, (one of) the first statistically based empirical classifications of controllers.

Groups of controllers will be distinguished based on *coherent combinations of activities* that they perform. Thereafter, *group membership will be related to possible variables* affecting this classification. These variables will be called 'triggers' from here onwards. The framework can help to formulate hypotheses that are tested in future studies. This research provides a more reliable basis

for such tests than existing classifications for they are marred by the aforementioned conceptual disagreement (De Loo et al., 2006). Therefore, the study described below is of a unique nature[1]. Roozen and Steens (2006) conclude that after Sathe (1982) "… no rigorous research into the controller's profession was executed" (p. 6). Rouwelaar (2006) was aware of only two research projects that measure and try to explain empirically "... the roles of [business unit] controllers by organisational characteristics" (p. 3), one of which was the present research in an early stage.

We will proceed with a discussion on the research structure and method respectively. Thereafter, an overview of how we gathered the information will be provided. Next, we will highlight our results. Finally, we will compare these with the existing literature, draw conclusions for practitioners, and provide directions for future research.

Research Structure

Considering the conceptual disagreement in the literature (De Loo et al., 2006), an empirical investigation into the aforementioned issues requires fundamental choices. In the remainder of this paper, controllers will therefore be defined as follows (Anthony and Young, 2004; Atkinson, Kaplan and Young, 2004; De Loo et al., 2006):

> *A controller supports and advises the management of an organisation in realizing their economic, public and/or financial goals. Support is interpreted in terms of the design and maintenance of management control and accounting information systems, and the procurement and distribution of information.*

In the literature many denominators are used to classify controllers in groups. For instance, their organisational position, responsibilities, activities and involvement in decision-making processes have all been used (Sathe, 1982). As the denominators to discern groups of controllers are so diverse, and no systematic connections between them have been made in the literature, rigorous choices are inevitable here as well. This research uses activities to discern groups of controllers (Katz and Kahn, 1978). Activities are a part of a controller's daily work and are likely to be an element of any classification of controllers (Ahrens and Chapman, 2000; Hopper, 1980; Jablonsky and Barsky, 2000; Mouritsen, 1996; Sathe, 1982; Simon et al., 1954; Riedijk, et al., 2002).

Then the question arises: what underlies the classification of controllers in distinct, activity-related groups? This is where the triggers come in. Following Sathe (1982), we will distinguish triggers external to the organisation of which a controller is part (like market conditions), triggers that are internal to an organisation but external to a controller (like the leadership style of someone's manager), and person-related triggers (like being introvert or extrovert).

Finally, three research questions are posed, namely:

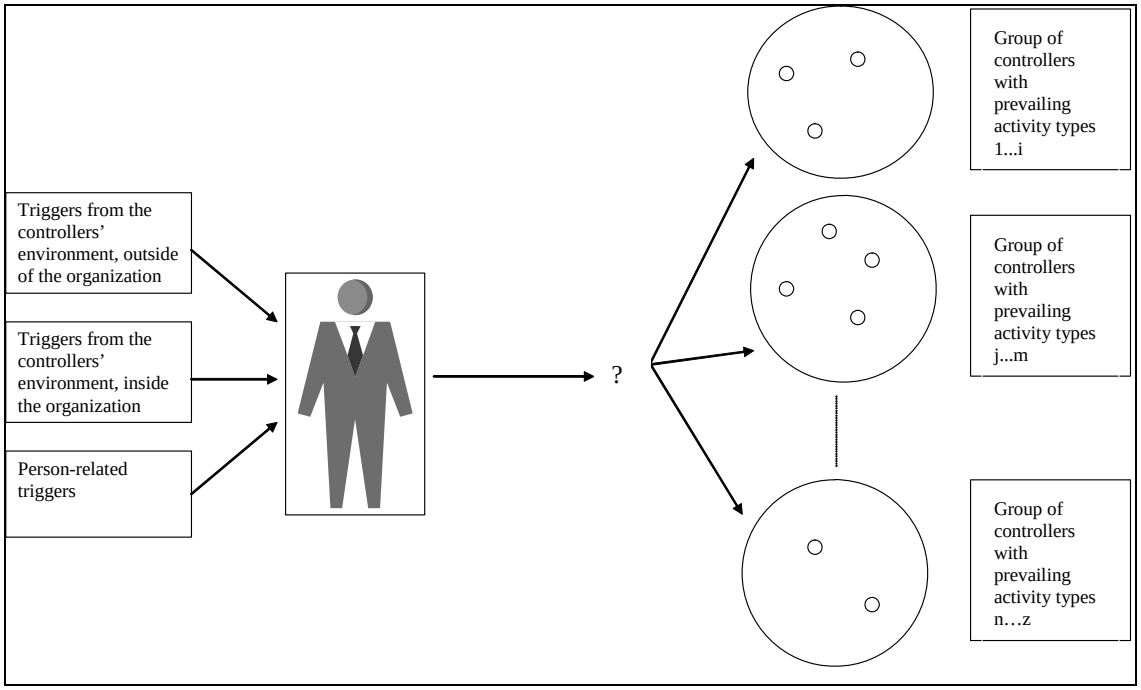
1. What coherent combinations of activities do controllers perform? In this way we can describe activity types, say 1 to z, that help to classify controllers in groups.

2. Which coherent groups of controllers can be found on the basis of the aforementioned activity types? For instance, there may be a group of controllers for which activity types 1 to i prevail, and others for which activity types j to m and n to z prevail. In this way we can characterize groups of controllers.

3. Do triggers of controller activities predict group membership and, if so, how far? In this way we can determine the triggers that significantly influence the division of controllers in groups.

[1] The study reported by Russell, Siegel and Kusleza (1999) is one of the few that at least *discusses* all of the aforementioned research steps. Alas, they are not jointly *analyzed*. There are studies that link up two of the three steps we combine though. Examples include Cohen and Paquette (1991), Hopper (1980), Mouritsen (1996) and Sathe (1982).

Figure One: Research Structure



Hence the research structure can be summarized as shown in Figure One.

Research Method

Overview

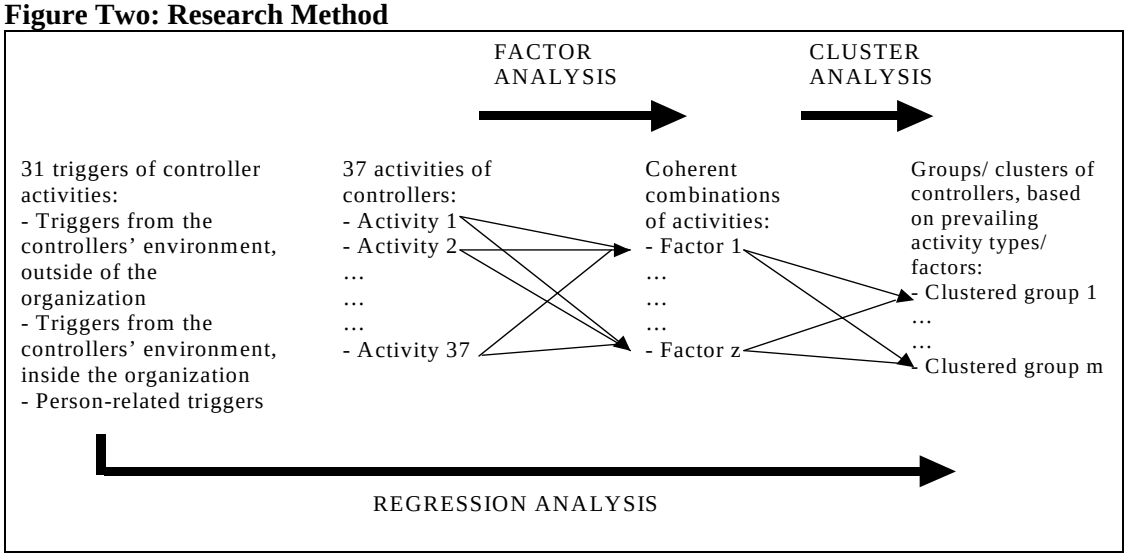
Up to now most research presupposed specific controller classifications and sought empirical confirmation thereafter (Cooper, 1996a,b; Kaplan, 1995; Jablonsky and Barsky, 2000; Sathe, 1982; and Riedijk, et al, 2002). As stated, this approach resulted in a great number of classifications that are difficult to compare. Therefore, another approach is followed here that can readily be tied to the research structure in Figure One. Firstly, a factor analysis will be used to determine the coherent combinations of activities that controllers perform. This step in the analysis will reduce the list of activities into a smaller list of factors. Secondly, as is often done in Marketing, cluster analysis is applied for partitioning the population of controllers in a number of groups based on the degree to which they are involved in the various combinations of activities (Hair et al., 1992). Finally, cluster membership will be regressed on various triggers to trace the significant ones that affect a controller's functioning. *In toto*, these analyses, depicted in Figure Two, address all of the aforementioned research questions.

Approach

Albeit the research questions listed in the previous Section are universal, only the situation in the Netherlands has been studied for reasons of practicality. Nevertheless, our results may in principle be useful for other countries as well given the similarities between controller activities across many, if not all, countries, particularly in Europe (Ahrens and Chapman, 2000; Kendall and Sheridan, 1991; and Lawrence, 1980).

The Open University of the Netherlands, the Free University Amsterdam, the Erasmus University Rotterdam and Groningen University joined forces to construct, test and spread a survey among the former graduates of the controller programs that these institutes have offered since 1994, following the procedures and research steps suggested by Oppenheim (1992). The data that are used in the analyses all stem from this survey, which is available from the authors on request and has been pre-tested before it was spread.

Figure Two: Research Method



Reliability and Validity issues

If we are to substantiate our research results, we have to safeguard their reliability and validity (Smith, 2003). Reliability refers to the extent to which measurements are consistent. Repeated measurements should yield identical results. Validity refers to whether or not what is measured is what is supposed to be measured. Even if a measurement is reliable, it may not be valid (Smith, 2003.).

We tried to enhance the validity of our research by distilling controller activities and triggers solely from the management accounting and control literature. Two researchers carried out this process separately. The activities and triggers retained were those deemed to be present in the literature. By applying various statistical techniques the validity of the findings was enhanced by looking for statistical generalizations (Yin, 1989). Finally, validity tests for the constructs mentioned below were carried out. If necessary, constructs were amended until their validity had been assessed. For reasons of space, we will not report all of the tests in this paper.

We obtained reliable findings by splitting up the sample in groups and using the same statistical techniques for each of these groups to see if this yields comparable results (Oppenheim, 1992). In addition, the factor, cluster and regression analyses were run using different assumptions and algorithms. As we will see below, only in case of the cluster analysis, variable results were found, but this seems to be inherent to cluster analysis (Milligan, 1980). An outlier elimination process largely redeemed this. Also note that we will not report all the variations that have been run, as this would take us too far astray.

Activities

Following the approach described by van Helden (1998), activities have been distilled from the controller classifications of Conijn, et al., 2003; Cooper 1996a,b; van Helden, 1998; Hopper 1980; Jablonsky and Barsky, 2000; Johnson, 1992; Kaplan, 1995 and Sathe, 1982. As stated, this was done separately by two researchers. The authors mentioned various dimensions of what constitutes a 'role' (like activities, responsibilities, obligations, etc.). These were translated into activities. That is, when an author addressed a particular role dimension (such as 'having the obligation to exchange information horizontally in an organisation'), the activities underlying this (in this case, 'exchanging information horizontally') were distilled. The activities found in this way were compiled on a list. As a consequence the activities are compatible with the classifications of controllers mentioned above.

However, it is unlikely that by so doing, all the activities that controllers perform in practice have been distinguished (Morgan

and Morrison, 1999). By choosing an appropriate statistical technique, the alpha factoring method (Harman, 1976), the possible negative side effects of this are mitigated. Furthermore, in the analyses we will also consider the possibility that controller activities are interrelated, namely by applying oblique rotations (Hair et al., 1992).

In Appendix One the 37 activities that we *did* uncover are shown. Every activity has been included as a separate question in the survey. Examples of these questions are shown in Appendix Three.

Triggers

Many triggers may affect the classification of controllers in groups (Sathe, 1982). For example, a controller may have to possess the capabilities and experience necessarily to perform his activities, and accept the responsibilities assigned, in order to feel accountable (Knight 1982). Personality traits are therefore a likely candidate to classify controllers in activity-related groups (Ahrens and Chapman, 2000; Hopper, 1980; Hunton, et al, 2000; Vaassen 2002). Characteristics of the organisation for which a controller works also seem to be an important trigger. For instance, controlling a scientific or innovative organisation in the chemical sector may require different forms of control than an assembly facility for cars (Cohen and Paquette, 1991). Finally, the environment of an organisation in terms of market conditions may be relevant to classify controllers (Friedman and Lyne, 1997). For example, when an organisation is confronted with heavy competition and decreasing margins, resulting in vanishing financial reserves, there may be a tendency to move to (more) financial controls and even cash control, pushing controllers out of the managerial and into the financial realm (Cohen and Paquette, 1991).

This research contains 31 triggers. They have been taken *directly* from previous research. To classify them, Sathe's (1982) categorization that we presented earlier in this paper will be used, which distinguishes between triggers from outside of the organisation, triggers from inside the organisation but outside of the controller's personal realm, and personal triggers. All triggers, which are listed in Appendix Two, have been included in one or more questions in the survey, as exemplified in Appendix Three.

As was the case with controller activities, the list of triggers is probably not exhaustive (Morgan and Morrison, 1999). Also, triggers may be interconnected (Sathe, 1982). By performing specific distribution tests on the error terms of the regression analyses that are carried out, this will be taken into account. Furthermore, the relevance of the Sathe's categories of triggers will be assessed, following the statistical procedures described by Judge et al. (1985).

Results

General remarks

At the time of the survey, over 1,300 (former) students had completed the controller programs of the institutions engaged in this research. They all received a survey instrument. Including two written follow-ups, about 26% of these students (339 respondents) returned the survey. Given its non-obligatory nature, and coupled with the fact that the address files included people who had moved since their graduation, people who had unfortunately passed away, emigrated, etc., this response rate is reasonable (Oppenheim, 1992).

Overview

We can now address the research questions. For a detailed account of how we derived our results, the interested reader is referred to Appendix Four. At this point it suffices to say that controller activities may, on the basis of the factor analysis we carried out, be subdivided in five coherent combinations of activities (for details, see Appendix Five). For reasons of brevity labels were attached to the five combinations in such a way that they presumably describe the general features of a factor.

The factors are[2]:

1. Designing and changing control systems and supporting change processes;
2. Internal reporting;
3. External reporting;
4. Supervising and maintaining accounting information systems;
5. Risk monitoring.

Secondly, given our cluster analysis, two groups of controllers can be distinguished, each emphasizing different activities. The group of controllers we decided to call 'watchmen' mainly perform scorekeeping and risk-monitoring activities (Simon et al., 1954). These respondents have relatively high [positive] mean factor scores on the previously mentioned factors 4 and 5, but relatively low [negative] scores on factors 1-3. On the contrary, so-called 'information adapters' acquire, analyse and manage information on the basis of organisational needs, focusing on organisational change processes (Sathe, 1982). These respondents have relatively high [positive] mean factor scores on the previously mentioned factors 1-3, but relatively low [negative] scores on factors 4-5. 55% of the controllers in the sample could be classified as information adapters and 45% as watchmen.[3]

Finally, in particular the set of triggers related to personality traits and the personal background of a controller play a role in determining whether someone is bound to be an information adapter or watchman. Our logistic regressions yielded the following significant triggers (for details, see Appendix Six):

1. Years of experience in a financial function;
2. Whether someone works as a staff member, line manager, both, or otherwise;
3. The size of an organisation (in terms of its number of employees);
4. The impact of ICT-developments on the control system of an organisation;
5. Whether someone is creative or rational;
6. Whether someone is introvert or extrovert.

The following was found with respect to the direction in which these triggers work:

1. The greater someone's financial experience, the more he is bound to be a information adapter;
2. The more someone is a line member, the more likely it is that he is a watchman;
3. The larger an organisation, the more someone is likely to be a watchman;
4. The more ICT-developments have an impact on control, the more someone is bound to be a information adapter;
5. The more someone is rational, the more he is likely to be a watchman;
6. The more someone is extrovert, the more often he may be classified as an information adapter.

Thus, a comprehensive picture of the controller profession has been derived from the survey data. This picture has been summarized in Figure Three below.

Discussion

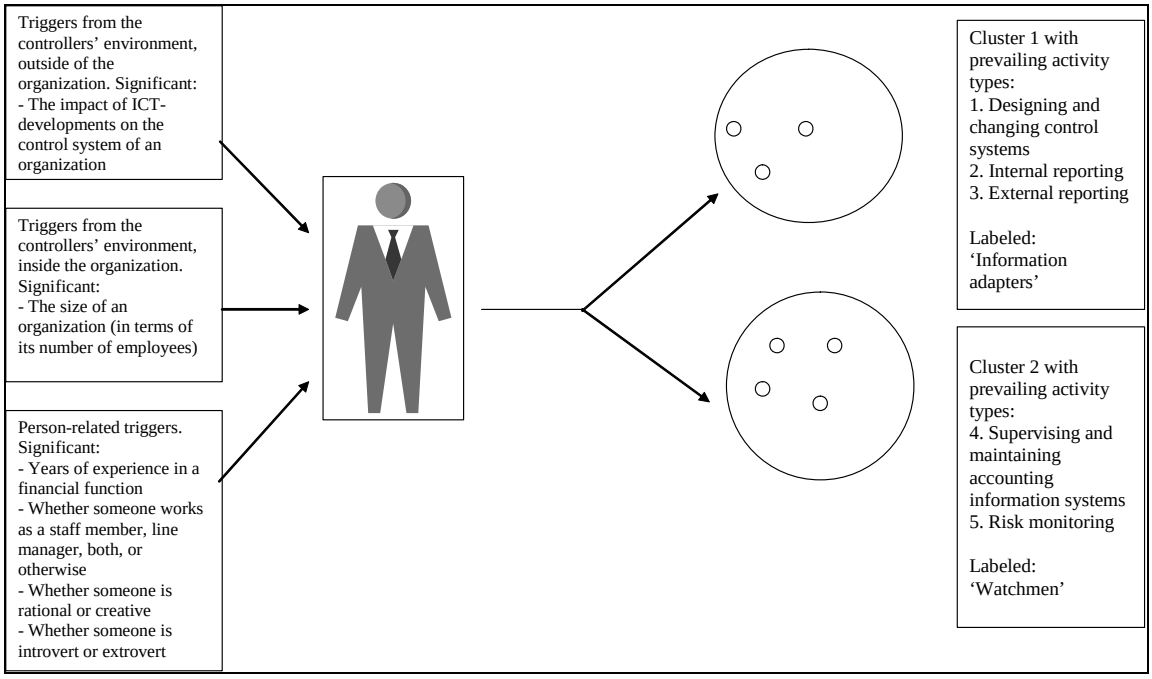
How does our research compare to previous studies? As far as the structure of the study is concerned, it is one of the few that apply advanced statistical techniques and it puts research on controller activities, controller groups and triggers in a single comprehensive exploratory framework. Case studies and interview methods are usually applied in this type of research, which aim to sustain presupposed groupings of controllers (Caglio, 2003, Cooper, 1996a,b, Friedman and Lyne, 1997, Riedijk, Tillema and Moen, 2002). In this study groups are discerned on the basis of statistical inferences. One of the notable predecessors is Mouritsen (1996), although he does not try to classify controllers in

[2] Such labels are to some extent arbitrary. Interpretations should preferably be based on the elements that underlay the factors. In particular, activities with high factor loading, see Appendix Five.

[3] These labels are to some extent arbitrary as well. Interpretations in the cluster analysis should preferably be based on the factors underlying the clusters (Hair et al., 1992).

groups, but rather bundles their activities. His research is complemented in several ways. Firstly, more triggers were taken into account in this research, as Mouritsen focuses on internal and person-related triggers. Secondly, a classification of controllers is incorporated in a specific research framework. Finally, more advanced statistical techniques are applied (most notably cluster analyses and logit regressions).

Figure Three: Research Results



How do our results compare to previous studies on controller roles and activities? The U.S. Institute of Management Accountants (IMA) among others studied the amount of time controllers spent on various activities, finding that they spent most of their time on business analysis and internal consulting activities (Russell, et al., 1999). Hopper (1980) focused exclusively on controller activities when studying the way in which controllers structure their work and the triggers that affect this, and discerned two roles: 'book-keepers' and 'service aids'. De Loo et al. (2006), using qualitative research techniques like interpretive interactionism, studied how controller activities are performed, resulting in a collection of behavioural patterns of controllers. Various authors describe how controller activities can be combined into coherent packages, for instance packages related to internal reporting or to designing and using accounting information systems (Mouritsen, 1996; and Sathe, 1982). Some have argued that the controller profession will develop in the direction of managerial and strategic control, away from the scorekeeping aspect (Russell, et al., 1999). This is line with the analyses of Kaplan (1995); Kendall and Sheridan (1991); and Riedijk, et al., (2002) among others. However, van Helden (1998) states that such a change in activities may be more 'wishful thinking' than actual practice. In this study we can see a distinction between the traditional scorekeeping or 'bean counter' type of activities performed by controllers (Friedman and Lyne, 1997, and Simon et al., 1954) and more proactive activities involving organisational change. Given that 45% of the controllers in our sample operate as watchmen, we concur with van Helden (1998) that scorekeeping activities in a controller's work are still very much alive. Controllers should not overlook them when implementing their

function, whilst organisations, when evaluating or (re)forming their financial function, should consider these as well.

The results correspond partly to Sathe's (1982) classification of controllers, but they partly do not. Sathe argues that controllers, on the one hand, are responsible for providing assistance in business decision-making. On the other, they are responsible for the integrity of financial information. Using this distinction he puts forward four controller roles: the 'independent', 'involved', 'strong' and 'split' controller. A 'split' controller involves two people, the other roles involve just one. In this research Sathe's distinction between involvement in decision-making and responsibility for the integrity of financial information comes forward in the differences between information adapters and watchmen. Information adapters carry out activities that are partly in line with his 'involved' controller, while his 'independent' controller tends to act partly along the lines of the watchmen. In Sathe's research an 'involved' controller is not heavily involved in reporting activities. However, in this study these activities are added to the work of information adapters, who combine this with supporting change processes. Therefore, the role of reporting in supporting change processes is highlighted in the segmentation of the controller profession as it comes forward. Watchmen focus on maintaining accounting information systems and risk monitoring, leaving the reporting bit more aside than Sathe's independent controller. In addition, in this paper two main groups of controllers are found instead of four. As we saw two types are substantiated in part, but in part they are not. In addition the 'split' controller cannot be discerned through research that focuses on individual controllers and not on organisations. As the existence of Sathe's 'strong' controller is not sustained, an organisation that is shaping the controller function should not assign activities from both clusters to one and the same controller thoughtlessly. Such a package of activities could be difficult to manage.

As far the triggers of controller activities are concerned, Caglio (2003) argues that even though most studies (including his own) emphasize internal organisational processes in determining what controllers (ought to) do, external and personal variables should be considered as well. This is precisely what has been done in this research. The fact that many significant triggers stemming from a controller's personal realm are found is in accordance with previous studies by Granlund and Lukka (1998) and Sathe (1982), among others. Hunton, et al., (2000) argue that person-related triggers such as technical and tacit knowledge, experience and problem-solving abilities all affect the performance of controllers. This is substantiated by the results reported above. Chenhall and Langfield-Smith (1998), although primarily examining the influence of changes in management accounting with regard to changes in performance measurement practices in organisations, also address the functioning of controllers. They distinguish five factors that affect a controller's outlook in performance management issues, among which are his fundamental technical skills, social skills and his position in the organisational hierarchy. These variables can readily be tied to three of the triggers deemed significant in this study. We therefore assert that information adapters and watchmen will carry out different activities when they are involved in performance measurement change, with information adapters taking on a more leading role than watchmen. Furthermore, we assert that the relative importance of the triggers stemming from a controller's personal realm may be in line with self-concept theory: people tend to choose their profession such that it is compatible with their personality (Super, 1957).

This research also addresses the discussion on which future scenarios are likely to come forward in the controller profession when new ICT-applications facilitate the introduction of different management accounting techniques (Friedman and Lyne 1997; Scapens and Jazayeri 2003). Various scenarios are mentioned: a scenario in which controllers change from 'bean

counters' to business-oriented management accountants, a 'no change' scenario, and a scenario in which accountants are replaced by engineers, leaving a remnant management accounting function. Our logit regression, which indicated that ICT-developments have an impact on controller classifications in such a way that more ICT-developments are likely to make someone an information adapter rather than a watchman, substantiates the first scenario if we do expect the permeation of ICT-developments to continue in the future.

The average age of controllers in our sample was 32 years, most of them having completed their studies less than three years ago, although they already had, on average, ten years of experience in a financial function. The majority of them (55%) operated as information adapters. The development from a 'pure' analyst to a business consultant sketched by Russell, et al., (1999) therefore seems to have materialized for these controllers already. Following Katz and Kahn (1978) and Sathe (1982), we do not believe however that they have reached the proverbial 'end of the line' as far as their career is concerned. The controller function is shaped organically in an organisation (Katz and Kahn, 1978; and Sathe, 1982). New future development paths may therefore emerge, be extended or changed and give rise to new or different groups of controllers, shaping new career possibilities. It may well be that the aforementioned controllers are still in the floundering or trial process stage of their career and not (yet) in the period of establishment, let alone the years of decline (Super, 1957). We conjecture that our results compare more favourably with Hall's (1976) stage of becoming established in early career years, as his next stage of mid-career maintenance and re-examination does not occur until someone is in his early forties. This is however something that has to be further assessed in future research.

What implications does this research have for practitioners? When taking Figure Three and the explanations in the 'Results' Section, we think there are implications for both controllers and organisations. We do not believe that since the external environment of organisations is changing, only business consultant type of controllers will be called for in the future. The claims that Kaplan (1995) and Russell, et al., (1999) among others made about this have not been substantiated in this research. Scorekeeping is still an important part of many a controller's daily work. We did find however that controller activities with a business consulting orientation do not mix very well with the more 'bean counter' oriented activities, as the controllers who performed these activities were placed in two distinct groups in this research. Controllers who mix all of these activities (so-called 'strong controllers') were not found at all. As was argued already, organisations should therefore focus on specific types of controller when hiring new personnel in particular seeking to hire either 'information adapters' or 'watchmen' with their corresponding packages of activities. This may be emphasized in function descriptions.

Caglio (2003) asserts that external organisational triggers, among other things, are important determinants of a controller's work. They are not deemed significant in this study however, with the exception of the aforementioned impact of ICT-developments on the control system of an organisation. From the relative low importance of external triggers as compared to organisational triggers and person-related triggers it can be distilled how an organisation can shape its financial function. The size of the organisational part for which the controller bears responsibility (one of the triggers in Figure Three), can be determined by the organisation itself, while recruitment and training could co-determine the person-related triggers of controllers' group membership. These are instruments that could consciously be deployed in developing a 'competent' controller. Given the high importance of personal triggers for controller roles it may be useful to stress these more clearly when hiring personnel. Our account of which personal-related characteristics match which type of controller can be helpful in this respect. This matching may subsequently be used by organisations for performance assessment purposes to highlight the way in which they

want to shape the controller function in the future. Career perspectives for controllers may then be derived from this, which may be used in future adds. As far as controllers themselves are concerned, they may consciously develop their 'soft skills' related to the significant triggers through course work or other activities.

A final issue we have to discuss is the generalization of our results. Do they only hold for the sample of controllers studied, for all controllers who graduated from the four institutions, or for all controllers in the Netherlands? The four institutions participating in this research cover the larger part of the national controller market, so in principle our results could be representative for *all* Dutch controllers, provided that they are representative for the group of graduates under consideration (Yin, 1989). As all respondents hold a registered degree in controlling, however, we could not assess the impact of holding such a degree as compared to not holding one for the activities and grouping of controllers. Given the response rate of 26%, we have to be careful in drawing generalized conclusions, albeit we do believe that our results are representative for our sample given the high compatibility of the research results when the sample was split.

Concluding Remarks

In summary, taking the limitations of this study in mind, organisations could in a sensible way try to match the combinations of activities assigned to controllers to organisational characteristics and to the person-related qualities as depicted in Figure Three. This could be done by means of organisational design, hiring and training. Organisational design could influence the packages of activities controllers perform and the size of organisational parts they are responsible for. Hiring and training can be useful tools for finding and developing the person-related characteristics that fit the activities required of the controller best. In line with it, performance management could try to develop the match mentioned above. For instance, in substantiating the functioning of an 'information adapter' it could be considered to assign him or her not too large an organisational unit and to develop the financial expertise and experience of such a controller. Besides, developing personal characteristics like becoming more extrovert can be given extra attention. Performance management should reflect the match that is made and try to assess the activities performed in context.

In future research, our activity-based approach to classify controllers could be enlarged beyond activities, for example by including controller responsibilities and tasks. From this, a multidimensional conception of controller roles could emerge that extends beyond activities. Note that a similar line of reasoning holds for the triggers. These have also been analysed with respect to activities alone. Triggers that are not significant here may be important in invoking other dimensions of controller roles. This has to be assessed in follow-up research as well. In future research, it may also be useful to question managers in order to get empirical evidence on the differences in perspective that exist between them and their controllers with regard to the way the latter (ought to) function (Katz and Kahn, 1978). Thus some of controllers' vested interests, which may have affected our results, may be purged (Denzin, 1970). Finally, our research can provide constructive input for hypotheses that can be tested in the future, for example with respect to changes in the controller profession over time and changes in the 'balance' between information adapters and watchmen that we have previously established. Reliable input to achieve this is available from our empirically informed comprehensive framework in Figure Three.

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Appendix One: Activities

1. *Constructing accounting information systems (including financial systems)* (Ahrens and Chapman, 2000, Cohen and Paquette, 1991, Jablonsky and Barsky, 2000, Knight, 1982, Russell, Siegel and Kulesza, 1999, Traas, 1997, Vaassen, 2002)

2. *Maintaining accounting information systems (including financial systems)* (Ahrens and Chapman, 2000, Cohen and Paquette, 1991, Jablonsky and Barsky, 2000, Knight, 1982, Russell, Siegel and Kulesza, 1999, Traas, 1997, Vaassen, 2002)

3. *Designing the control system of an organisation* (Cohen and Paquette, 1991, Conijn, Knoops and Uiterlinden, 2003, Knight, 1982, Sathe, 1982, Vaassen, 2002)

4. *Changing the control system of an organisation (like its budget cycles)* (Cohen and Paquette, 1991, Conijn, Knoops and Uiterlinden, 2003, Knight, 1982, Sathe, 1982, Vaassen, 2002)

5. *Maintaining the control system of an organisation without making changes* (Cohen and Paquette, 1991, Conijn, Knoops and Uiterlinden, 2003, Knight, 1982, Sathe, 1982, Vaassen, 2002)

6. *Protecting organisational assets through internal control* (Conijn, Knoops and Uiterlinden, 2003, Sathe, 1982)

7. *Assessing the risks connected with business conduct* (Conijn, Knoops and Uiterlinden, 2003, Russell, Siegel and Kulesza, 1999)

8. *Performing audits in an organisation* (Conijn, Knoops and Uiterlinden, 2003, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

9. *Preparing reports for responsibility accounting purposes and organisational control* (Hopper, 1980, Friedman and Lyne, 1997, Jablonsky and Barsky, 2000, Knight, 1982, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

10. *Presenting reports for responsibility accounting purposes and organisational control* (Jablonsky and Barsky, 2000, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

11. *Preparing reports for third parties (for example for accountants)* (Colton, 2001, Jablonsky and Barsky, 2000, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

12. *Presenting reports for third parties (for example for accountants)* (Colton, 2001, Jablonsky and Barsky, 2000, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

13. *Performing business analyses* (Hopper, 1980, Russell, Siegel and Kulesza, 1999, Sathe, 1982, Traas, 1997)

14. *Interpreting business analyses* (Hopper, 1980, Russell, Siegel and Kulesza, 1999, Sathe, 1982, Traas, 1997)

15. *Giving advice proactively* (Conijn, Knoops and Uiterlinden, 2003, Hopper, 1980, Kendall and Sheridan, 1991, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

16. *Giving advice reactively* (Conijn, Knoops and Uiterlinden, 2003, Hopper, 1980, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

17. *Leading the administrative department of an organisation* (Jablonsky and Barsky, 2000, Vaassen, 2002)

18. *Negotiating with auditors about proposed changes in the control system(s) of an organisation* (Jablonsky and Barsky, 2000, Sathe, 1982)

Appendix One: Activities (Continued)

19. *Exchanging information vertically* (Jablonsky and Barsky, 2000, Kendall and Sheridan, 1991, Knight, 1982)

20. *Exchanging information horizontally* (Jablonsky and Barsky, 2000, Kendall and Sheridan, 1991, Knight, 1982)

21. *Exchanging information with third parties* (Jablonsky and Barsky, 2000, Sathe, 1982)

22. *Supporting the goals of the top management of an organisation* (Jablonsky and Barsky, 2000, Kendall and Sheridan, 1991)

23. *Supporting the goals of the line management of an organisation* (Jablonsky and Barsky, 2000)

24. *Supporting the goals of external parties* (Jablonsky and Barsky, 2000)

25. *Providing information on a 'need to know' basis* (Jablonsky and Barsky, 2000, Kendall and Sheridan, 1991)

26. *Providing information to those who may be interested* (Conijn, Knoops and Uiterlinden, 2003, Jablonsky and Barsky, 2000)

27. *Reporting information prospectively (before the fact control)* (Conijn, Knoops and Uiterlinden, 2003, Jablonsky and Barsky, 2000, Kendall and Sheridan, 1991, Sathe, 1982, Traas, 1997)

28. *Reporting information retrospectively (after the fact control)* (Conijn, Knoops and Uiterlinden, 2003, Hopper, 1980, Friedman and Lyne, 1997, Jablonsky and Barsky, 2000, Kendall and Sheridan, 1991, Knight, 1982, Sathe, 1982)

29. *Processing information from formal, financial systems* (Cohen and Paquette, 1991, Conijn, Knoops and Uiterlinden, 2003, Hopper, 1980, Friedman and Lyne, 1997, Kendall and Sheridan, 1991, Knight, 1982, Sathe, 1982)

30. *Processing information from formal, non-financial systems (like operational systems)* (Cohen and Paquette, 1991, Colton, 2001, Conijn, Knoops and Uiterlinden, 2003, Friedman and Lyne, 1997, Sathe, 1982)

31. *Processing information from informal systems (like social systems)* (Conijn, Knoops and Uiterlinden, 2003, Sathe, 1982)

32. *Reporting financial information* (Cohen and Paquette, 1991, Conijn, Knoops and Uiterlinden, 2003, Cooper, 1996a,b, Friedman and Lyne, 1997, an Helden, 1998, Hopper, 1980, Kaplan, 1995, Kendall and Sheridan, 1991, Knight, 1982, Russell, Siegel and Kulesza, 1999, Sathe, 1982)

33. *Reporting non-financial information* (Cohen and Paquette, 1991, Conijn, Knoops and Uiterlinden, 2003, Cooper, 1996a,b, van Helden, 1998, Johnson, 1992, Kaplan, 1995, Sathe, 1982)

34. *Supporting change processes* (Colton, 2001, Cooper, 1996a,b, van Helden, 1998, Johnson, 1992, Kendall and Sheridan, 1991)

35. *Leading change processes* (Colton, 2001, van Helden, 1998, Kaplan, 1995, Traas, 1997)

36. *Supporting strategy formulation processes* (Colton, 2001, Conijn, Knoops and Uiterlinden, 2003, Kendall and Sheridan, 1991, Russell, Siegel and Kulesza, 1999)

37. *Leading strategy formulation processes* (Conijn, Knoops and Uiterlinden, 2003, Russell, Siegel and Kulesza, 1999)

Appendix Two: Triggers

Triggers from the surroundings of an organisation
1. *The extent to which the market competes on price or quality* (Friedman and Lyne, 1997, Russell, Siegel and Kulesza, 1999)
2. *The extent to which the market is stable or dynamic* (Cohen and Paquette, 1991, Cooper, 1996a,b, Kendall and Sheridan, 1991, van der Meer-Kooistra, 1999, Mouritsen, 1996)
3. *The extent to which laws and regulations are static or variable* (Cohen and Paquette, 1991, Kendall and Sheridan, 1991, Mouritsen, 1996, Vaassen, 2002)
4. *The extent to which technological advances in the market influence organisational business* (Bromwich and Bhimani, 1991, Bruggeman and Slagmulder, 1995, Friedman and Lyne, 1997, van der Meer-Kooistra, 1999, Mouritsen, 1996)
5. *The impact of ICT-developments on the control system of an organisation* (Caglio, 2003, Colton, 2001, Friedman and Lyne, 1997, Russell, Siegel and Kulesza, 1999)
Internal organisational triggers.
6. *Organisational strategy* (Colton, 2001, Friedman and Lyne, 1997, Shank and Govindarajan, 1993, Vaassen, 2002)
7. *Leadership style of someone's manager* (Vaassen, 2002)
8. *Organisational structure (in terms of its legal body)* (Ahrens and Chapman, 2000, Jablonsky and Barsky, 2000, Vaassen, 2002)
9. *Financial status of an organisation* (Knight, 1982, van der Meer-Kooistra, 1999, Riedijk, Tillema and Moen, 2002)
10. *The primary line of business of an organisation* (Cohen and Paquette, 1991, Jablonsky and Barsky, 2000, Vaassen, 2002)
11. *The size of an organisation (in terms of its number of employees)* (Cohen and Paquette, 1991, Jablonsky and Barsky, 2000, Knight, 1982, van der Meer-Kooistra, 1999, Riedijk, Tillema and Moen, 2002)
Person-related triggers
12. *Years of experience in a financial function* (Ahrens and Chapman, 2000, Hunton, Wier and Stone, 2000, Knight, 1982, Mouritsen, 1996, Riedijk, Tillema and Moen, 2002)
13. *Level in the organisation where someone is employed* (Ahrens and Chapman, 2000, Hopper, 1980, Knight, 1982, Mouritsen, 1996, Riedijk, Tillema and Moen, 2002)
14. *Whether someone works as a staff member, a line member, both, or otherwise* (Hopper, 1980, Sathe, 1982)
15. *Whether someone is a generalist or business specialist* (Hopper, 1980, van der Meer-Kooistra, 1999)
16. *Whether someone is an executor or thinker* (Sathe, 1982)

Appendix Two: Triggers (continued)

Person-related triggers (Continued)

17. *Whether someone is rational or creative* (Russell, Siegel and Kulesza, 1999)

18. *Whether someone is diplomatic or coercive* (Sathe, 1982)

19. *Whether someone is individually oriented or focused on teamwork* (Russell, Siegel and Kulesza, 1999, Vaassen, 2002)

20. *Whether someone is reactive or proactive* (Hopper, 1980, Hunton, Wier and Stone, 2000, Knight, 1982, Sathe, 1982)

21. *Whether someone is reserved or talkative* (Russell, Siegel and Kulesza, 1999)

22. *Whether someone is pragmatic or critical* (Sathe, 1982)

23. *Whether someone is subjective or objective* (Knight, 1982, van der Meer-Kooistra, 1999, Mouritsen, 1996)

24. *Whether someone applies general or financial knowledge* (Hopper, 1980, Hunton, Wier and Stone, 2000, Knight, 1982, van der Meer-Kooistra, 1999, Mouritsen, 1996)

25. *Whether someone focuses on concrete business applications or general analyses* (Hopper, 1980, Hunton, Wier and Stone, 2000, Mouritsen, 1996, Vaassen, 2002)

26. *Whether someone is introvert or extrovert* (Hunton, Wier and Stone, 2000, Russell, Siegel and Kulesza, 1999)

27. *The number of years since the completion of someone's studies (as a controller)* (Knight, 1982, van der Meer-Kooistra, 1999)

28. *The highest level of study* (for example, the university level) (Ahrens and Chapman, 2000)

29. *The institution where the final degree in controlling was obtained* (Ahrens and Chapman, 2000)

30. *Age* (van der Meer-Kooistra, 1999)

31. *Gender* (van der Meer-Kooistra, 1999)

Appendix Three: Examples of Survey Questions

I. Activities ***(note that between brackets, references to the activities in Appendix One are shown)***

Below you will find a list of activities that you may or may not perform as a controller. The list is not exhaustive. It may be that some activities appear to be alike or partly overlap. Please interpret all activities as separate entities. Indicate, on a scale ranging from 1 to 6, to what extent you are involved in these activities, on average, on a daily basis. Only take your *current function* into account.

	Never At All	***Seldom***	***Now And Then***	***Frequently***	***Very Frequently***	***Continuously***
Reporting information retrospectively (after the fact control) [ACTIVITY 28]	1 O	2 O	3 O	4 O	5 O	6 O
Providing information to those who may be interested [ACTIVITY 26]	1 O	2 O	3 O	4 O	5 O	6 O
Supporting the goals of the top management of an organisation [ACTIVITY 22]	1 O	2 O	3 O	4 O	5 O	6 O
Leading change processes [ACTIVITY 35]	1 O	2 O	3 O	4 O	5 O	6 O
Presenting reports for responsibility accounting purposes and organisational control [ACTIVITY 10]	1 O	2 O	3 O	4 O	5 O	6 O
Preparing reports for third parties (for example for accountants) [ACTIVITY 11]	1 O	2 O	3 O	4 O	5 O	6 O
Supporting strategy formulation processes [ACTIVITY 36]	1 O	2 O	3 O	4 O	5 O	6 O
Negotiating with auditors about proposed changes in the control system(s) of an organisation [ACTIVITY 18]	1 O	2 O	3 O	4 O	5 O	6 O
Giving advice reactively [ACTIVITY 16]	1 O	2 O	3 O	4 O	5 O	6 O

II. Triggers ***(note that between brackets, references to the triggers in AppendixTwo are shown)***

A. Please provide only one answer for each question. Give the answer that corresponds (best) to your *current situation*.

1. How much experience do you have in a financial function? [TRIGGER 12]
- o less than 1 year
- o between 1 and 4 years
- o between 5 and 9 years
- o 10 years or more

2. How long ago did you complete your controller studies? [TRIGGER 27]
- o less than 3 years ago
- o between 3 and 5 years ago
- o between 6 and 9 years ago
- o 10 years ago or more

3. What is the size of your organisation in full-time equivalents (fte)? [TRIGGER 11]
- o less than 50 fte
- o between 50 and 99 fte
- o between 100 and 199 fte
- o between 200 and 499 fte
- o 500 fte or more

4. What is your age? [TRIGGER 30]
- o younger than 35
- o between 35 and 39
- o between 40 and 44
- o between 45 and 49
- o between 50 and 64
- o 65 or older

B. The next question contains several personal characteristics that are grouped in pairs. Could you indicate how far these characteristics are representative of yourself *in your work as a controller*? Please note that there are no 'right' or 'wrong' answers. Provide only one answer for each characteristic.

generalist	o o o o 1 2 3 4	business specialist [TRIGGER 25]
executor	o o o o 1 2 3 4	thinker [TRIGGER 16]
creative	o o o o 1 2 3 4	rational [TRIGGER 17]
diplomatic	o o o o 1 2 3 4	coercive [TRIGGER 15]
individually oriented	o o o o 1 2 3 4	focused on teamwork [TRIGGER 19]
introvert	o o o o 1 2 3 4	extrovert [TRIGGER 26]

C. Please express your opinion about the following remark: "I work in a financially healthy organisation" [TRIGGER 9]

O	O	O	O	O	O	O
1	2	3	4	5	6	7
Fully disagree	Largely disagree	Somewhat disagree	Somewhat agree	Largely agree	Fully agree	No answer

Appendix Four: Statistical details

Factor Analysis

190 Controllers answered all of the questions related to the 37 activities. They indicated on a Likert-6 scale (ranging from 'never at all' to 'continuously') how intensely they were busy with these activities in their daily work. The alpha factoring method with an oblique rotation was applied to order and abridge the list of activities so as to generate valuable input for the cluster analysis (Harman, 1976, Johnson and Wichern, 1992)[4]. The data had first been checked for the absence of multicollinearity using their rank correlation matrix (Ramanathan, 1992).

An analysis of the scree plot that resulted from the factor analysis (Wells and Sheth, 1974, Hair et al., 1992, Tacq, 1997) led to the identification of the following five factors, which could easily be interpreted and explained 46.5% of the variance in the underlying activities:

1. Designing and changing control systems and supporting change processes;\
2. Internal reporting;
3. External reporting;
4. Supervising and maintaining accounting information systems;
5. Risk monitoring.

A more detailed output of the analysis is shown in Appendix Five.

Cluster Analysis

A hierarchical clustering algorithm called 'Ward's method' was used to group controllers, following the suggestions by Milligan (1980) and Hair et al. (1992)[5]. The commonly used squared Euclidean distance was used as distance measure (Hair et al., *ibid.*). From the so-called 'agglomeration schedule' it was deduced, on the basis of the relative increase in distance bridged between two successive clusters, how many clusters were to be extracted (Hair et al., *ibid.*). Cluster membership was then 'fine-tuned' by performing a non-hierarchical cluster analysis, using the sequential threshold procedure with the cluster centroids stemming from the first analysis as the starting midpoints of the new clusters, whilst correcting for the influence of outliers (Hair et al., *ibid.*, Hoaglin, Mosteller and Tukey 1983)[6]. Thereafter, two clusters could clearly be distinguished, the results of which were confirmed by means of a t-test (Hair et al., 1992). We ended up with a cluster of controllers that we decided to call *'information adapters'* (that is, respondents who have relatively high [positive] mean factor scores on the previously mentioned factors 1-3, but relatively low [negative] scores on factors 4-5), and a cluster consisting of controllers who predominantly operate as *'watchmen'* (that is, respondents for whom the high and low mean factor scores on the various factors are exactly opposite to the previous cluster)[7]. Watchmen mainly perform scorekeeping and risk-monitoring activities (Simon et al., 1954), while information adapters acquire, analyse and manage information on the basis of organisational needs, focusing on organisational change processes (Sathe, 1982). 55% Of the controllers (109 respondents) in the sample could be classified as information adapters and 45% (71 respondents) as watchmen.

[4] Even so, various other factor analyses were performed, based among others on the regularly used principal component method. These yielded highly comparable results. The results for groups of students of the Open University of the Netherlands on the one hand and those from the other institutions on the other were compatible as well.

[5] Experiments with other clustering algorithms like single or complete linkage yielded highly variable results. This is not uncommon in cluster analysis (Hair et al., 1992). For example, in the Milligan (1980) study, which used fabricated data, inconsistent results were found as well. Ward's method was however the best all-round performer.

[6] Ten controllers were removed from the sample as a consequence.

[7] The final mean factor scores for the five factors underlying the cluster of information adapters were .3808, .2491, .4986, -.4019 and -.1347. For watchmen they were -.6282, -.3147, -.6707, .6374 and .2487 respectively.

Logistic Regression

The two clusters were linked with the 31 triggers (which were measured on Likert-4 to Likert-6 scales) by a backward logistic regression (Theil, 1971). Cluster membership was regressed, using maximum likelihood procedures, on all of the triggers after the absence of multicollinearity had been confirmed (Tacq, 1997). Tests for the homogeneity of variance of the residuals and a binomial distribution of the predicted group membership were subsequently confirmed as well (Theil, 1971). However, the triggers could have been split into theoretically feasible groups in advance (Sathe, 1982). Therefore, the null hypothesis was tested that all variables in a group equalled zero for each group, following the procedures described by Judge et al. (1985). It was found that especially the group of triggers stemming from a controller's personal realm was statistically significant in predicting cluster membership. At a significance level of .05, the influence of organisational triggers on cluster membership was barely accepted and the influence of the triggers stemming from outside of an organisation was rejected. In further analyses, using canonical correlation techniques (Hair et al., 1992), it was found that the mutual influences between groups of triggers were very limited. Given these limited influences, we decided to stick to the original backward regression in which the 31 triggers had been entered separately. A detailed output of this regression is shown in Appendix Six.

Six triggers turned out to contribute significantly to the classification of controllers as information adapters or watchmen, classifying 68.5% of all controllers in the sample correctly[8]:

1. Years of experience in a financial function;
2. Whether someone works as a staff member, line manager, both, or otherwise;
3. The size of an organisation (in terms of its number of employees);
4. The impact of ICT-developments on the control system of an organisation;
5. Whether someone is creative or rational;
6. Whether someone is introvert or extrovert.

Whether one is creative or rational was the statistically most significant trigger in determining cluster membership (with a *p*-value of .002). Whether someone works as a staff member or line member was the least significant (with a *p*-value of .099). Information adapters were correctly classified in 78.2% of the cases. Watchmen were correctly classified in 53.1% of the cases (the overall average being, as stated, 68.5%). The triggers we used may therefore suit information adapters better than watchmen. In case we solely examine the latter type of controller, more triggers may be relevant than the ones addressed in Appendix Two.

The following was found with respect to the expected signs of the significant triggers:

1. The greater someone's financial experience, the more he is bound to be a information adapter;
2. The more someone is a line member, the more likely it is that he is a watchman;
3. The larger an organisation, the more someone is likely to be a watchman;
4. The more ICT-developments have an impact on control, the more someone is bound to be a information adapter;
5. The more someone is rational, the more he is likely to be a watchman;
6. The more someone is extrovert, the more often he may be classified as an information adapter.

[8] This is the only goodness-of-fit measure we will present. Although a pseudo-R^2 could have been calculated, this measure would have been difficult to interpret since it was between its boundary values of 0 and 1 (Judge et al., 1985).

Appendix Five: Factor Analysis Summary[9]

	Factor Loading				
Activity	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Reporting information retrospectively (after the fact control)		0.64092			
Changing the control system of an organisation (like its budget cycles)	0.65505				
Supporting the goals of the top management of an organisation					
Maintaining accounting information systems (including financial systems)				-0.56353	
Presenting reports for third parties (for example for accountants)			0.76383		
Providing information on a 'need to know' basis		0.45172			
Protecting organisational assets through internal control					
Exchanging information vertically					
Reporting financial information		0.71651			
Giving advice proactively					
Reporting information prospectively (before the fact control)					
Maintaining the control system of an organisation without making changes					
Processing information from formal, financial systems		0.63179			
Preparing reports for third parties (for example for accountants)			0.82429		
Supporting change processes	0.53091				
Interpreting analyses of factors influencing business results					
Supporting the goals of the line management of an organisation					
Designing the control system of an organisation	0.72873				
Exchanging information horizontally					
Leading the administrative department of an organisation				-0.69253	
Providing information to those who may be interested					
Preparing reports for responsibility accounting purposes and organisational control		0.57552			
Reporting non-financial information					
Constructing accounting information systems (including financial systems)	0.66357				
Processing information from formal, non-financial systems (like operational systems)					
Presenting reports for responsibility accounting purposes and organisational control					
Leading change processes	0.5146				
Preparing analyses of factors influencing business results					
Supporting the goals of external parties			0.66791		
Giving advice reactively					
Exchanging information with third parties (for example with accountants)			0.83301		
Processing information from informal systems (like social systems)					
Assessing the risks connected with business conduct					-0.54277
Negotiating with auditors about proposed changes in the control system(s) of an organisation					-0.48316
Leading strategy formulation processes					
Performing audits in an organisation					
Supporting strategy formulation processes					
Eigen value	**8.9**	**3.3**	**2.5**	**1.5**	**1.1**
Explained variance in underlying activities by a factor	**23.90%**	**8.90%**	**6.80%**	**4.00%**	**2.90%**
Total variance explained by factors					**46.50%**

[9] Note that only factor loadings larger than or equal to .40 (in an absolute sense) are shown.

Appendix Six: Logistic Regression Summary

Variable	Coefficient Value	Significance (two-tailed at a 5% significance level)
Years of experience in a financial function	–,7162	,0094
Whether someone works as a staff member, line manager, both, or otherwise	,2842	,0994
Whether someone is introvert or extrovert	–,5736	,0147
Whether someone is creative or rational	,7856	,0021
The size of an organisation (in terms of its number of employees)	,2550	,0469
The impact of ICT-developments on the control system of an organisation	–,2692	,0603
Constant	,7796	,2456
Correctly classified information adapters: 78,22% *Correctly classified watchmen: 53,13%* *Overall: 68,48%*		