

Alternative Accounting to Manage Intellectual Capital

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Abstract: The connection of intangible assets to cash flow generation is a major management issue. In addition, a majority of the investment is made in the intangible capital items. This paper intends to present an approach that supports the continuous measurement of intangible assets and allows an extended value based management framework that considers both tangible and intangible elements.

The value of a company includes significant elements that are not described by the generally accepted accounting methods such as relationship capital, organizational capital, and knowledge and competence of employees. These elements are possible to be presented in an expanded balance sheet.

We face challenges when we try to quantify the elements for a concrete date or when we intend to capture the exact changes throughout a certain period. Based on generally accepted accounting standards, the investment into intellectual assets is mostly handled as cost. This cost is accountable against the revenue of the period therefore decreasing the period's profit. This approach does not allow the carrying forward of any cost element for future periods, even in the case of a long term cost.

If we reconsider our cost management framework and the costs that serve the development or replacement of intellectual capital items we manage as capital expenditures in intellectual capital items and not as a period's expense, we could build up a ground-up approach to the handling of intellectual capital items. This approach results in the compilation of two balance sheets and profit & loss accounts that are alternative versions of each other. The visualization of intellectual assets and intellectual capital might significantly change the decision making process and the general thinking of the management.

The authors suggest further research in order to support the development of the conceptual framework and the operational rules of practice.

Keywords: intellectual capital; value based management; measurement; alternative accounting; intangible balanced sheet

1. Introduction

Thinking based on axioms is of great importance for both science and practice. Once the axioms are defined according to the empirical postulates we can safely rely on them. This fact simplifies and therefore supports any further thinking. It is important that simplification based on axioms can only support thinking in case it is in harmony with the empirical postulates. In changing circumstances the axioms should be reviewed from time to time in order to keep conformity with empirical postulates. The axiomatic framework set by Euklides and Ptolemaios was in full harmony with the requirements of an ancient society. In modern society however, these axiomatic frameworks have needed to be adjusted. There are plenty of axioms used in economics. These axioms support management thinking by providing general guidance. We should not take these axioms as unquestionable rules: in case conflicts are identified among axioms and the empirical

requirements, the axioms should be carefully rethought and – if needed – readjusted.

In our research we also identified an area where the related axioms and the empirical requirements conflict: the proper identification and management of the real asset value of an enterprise. The value of a company includes significant elements that are not described by the generally accepted accounting methods. The customer and supplier relationships, the knowledge related to the organisation and the knowledge and competence owned by employees are such elements. Current accounting practices – in general – do not allow for the visualisation of these assets (often referred as intellectual assets, or intellectual capital¹) in the company's balance sheet. There is one exception

¹ Intellectual capital and Intellectual assets are referring to the same resources, therefore could be used as synonyms, although the "intellectual asset" label refers to the asset side of the balance sheet while the "intellectual capital" refers to the ownership of these assets. Throughout the text we are using both terms as synonyms.

however; in the case of a company acquisition the buyer is allowed to represent goodwill in its accounts when the book value of the purchased entity is below the purchase price. The importance of intellectual capital in the value of a company is increasing rapidly. Due to the fact, that accounting standards do not support the reporting of these assets, the task of management teams is getting even more complex because it is extremely difficult to manage something that you cannot properly visualise. Our intention is to provide guidelines and support for the entities that intend to manage these elements by integrating related management information into existing reporting frameworks. By doing this we can help these companies operate more efficiently. For this task we also need to touch and rethink certain axioms of economics.

2. The shift among tangible and intangible assets

- Fewer and fewer companies have operations primarily involving physical assets. Instead, most companies are service providers.
- Among production factors there is a remarkable shift to the intangible (i.e. intellectual) elements.

The above statements are true in most industry sectors worldwide. Research shows that on average 75% of the company's value is not described on its Balance sheet (Zambon 2005). Investigation and research carried out by the authors among Hungarian entities resulted in similar findings. Companies taking action in this field are not limited to certain industry segments. In general those entities are more open to putting a larger emphasis on these assets that have a higher "intellectual capital index"². There are several reasons why we should concentrate on this process. In general, the value of a company is significantly higher than its book value; therefore we cannot neglect answering the question why this occurs. The increasing company value – in most cases – does not mean that the total book value of assets is growing with the same rhythm, moreover the proportion of total book value of assets to company value is getting smaller as the company value grows. In such a situation we should be able to predict the resulting increasing company value. Does the profit making capability of the physical assets grow with an increased marginal productivity or are there hidden assets behind the ones presented in the balance sheet? The book value only represents the value of the physical assets and the value of certain – but limited – intangibles (e.g. software and patents).

The market value of a company consists of other elements, such as

- Relationship capital (external structure related value)
- Organisational capital (internal structure related value)
- Knowledge and competence of employees (employee related value)

Relationship capital includes customer, supplier and other relationships. In addition this represents references, public relationship value and the image of the company (and its products). These elements could represent a significant proportion of the company's value. Yet only small portions of such elements (such as patents) are allowed to be indicated in the company accounts. Organisational capital includes standardised and customised processes, information and administration systems/frameworks and company culture. These elements differentiate the entity from similar organisations (besides relationship capital and individual employees) and allow the organisation to be unique in its own way. Knowledge and competence of employees describes the value assigned to individual employees. This refers to the capability of employees to create material or immaterial assets and properties. These elements are strongly related to the manpower of the company (or are very difficult to harvest it without them) therefore we could define them as knowledge capital or intellectual capital. Based on the previously described factors, the balance sheet describing the capital of a company should be expanded by these newly introduced elements. The expanded balance sheet is described in Figure 1.

3. How can we identify and quantify the intellectual capital of an entity?

Theoretically we could easily identify the elements of intellectual capital. The theoretical identification does not need exact data, and the components will be the same for every company. However, we face challenges when we try to quantify the elements for a concrete date or when we intend to capture the exact changes throughout a certain period. The simplest approach to capturing the amount of intellectual capital is to first determine:

- The market value of the company, or
- The quantified strategic plan of the company.

In the latter case we could identify the discounted free cash flow of the entity based on the strategic plan. This enables us to measure the value of the company, therefore finally version B, equals version A.

² $2 = (\text{Company Value} - \text{Book value of assets}) / \text{Company value}$

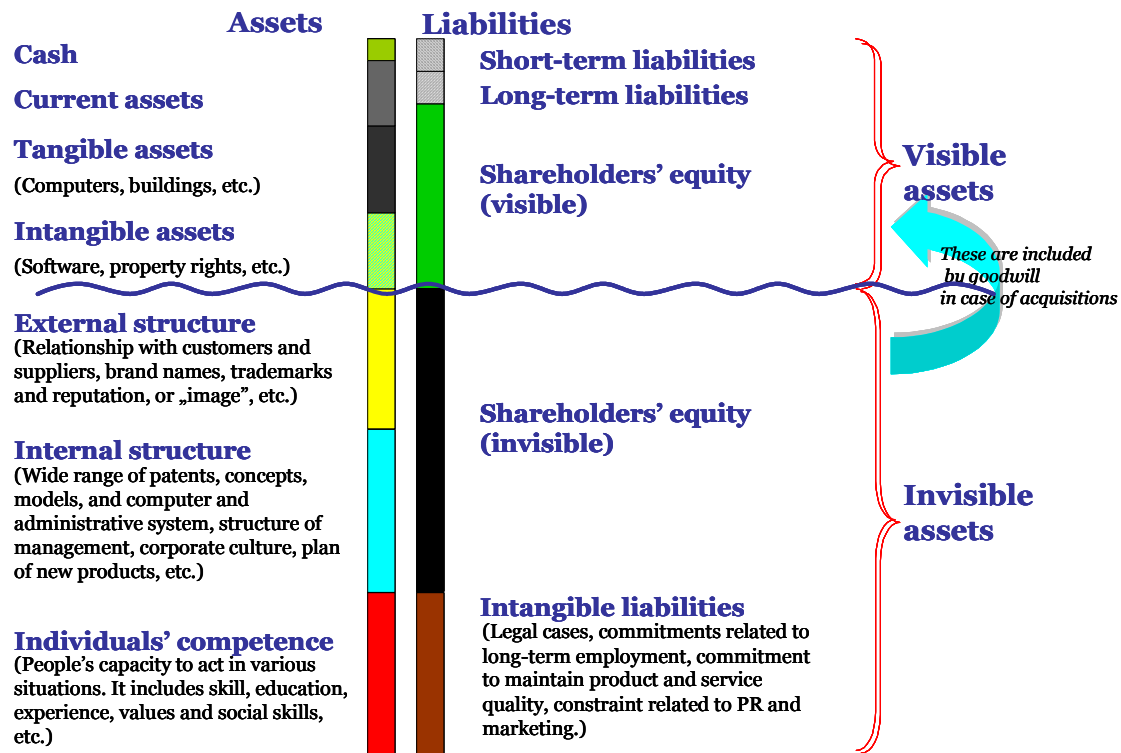


Figure 1: Structure of expanded balance sheet

In case of listed companies the value of the entity is always available (although not always reliable for various reasons) – version A –, while for unlisted companies it is available only on a case-by-case basis (i.e. when having an offer from a potential investor). Should there be any problem with the availability of market value, we can always rely on version B, to identify the required information. The basic – and a bit simplified – formula for identifying total amount of intellectual capital is to subtract the book value of total assets from the market value of the company. Having this data available – unfortunately – does not provide information about the elements of intellectual capital.

Since the value of the company comes from both the physical assets and the intellectual assets of the entity, proper value based management requires the management of the intellectual assets, too. The balanced way of managing the value of a company is accomplished by concentrating on both crucial elements. When managing material assets, we have a lot of information available from the conventional management reports, where we can see the physical assets, the working capital and other elements in detail. The process of identifying intellectual capital that we investigated above only gives us an overall value. This identification process does not give us understanding and therefore the ability to manage the individual

components of intellectual capital. We need to find a proper way to capture this information.

4. Money spent on intellectual capital – is it cost or investment?

Based on generally accepted accounting standards, the investment into intellectual assets is mostly handled as cost. This cost is accountable against the revenue of the period therefore decreasing the period's profit. This approach does not allow the carrying forward of any cost element for future periods, even in the case of a long-term cost (like the tutorial fee of an internal training). There is one exception that we have already mentioned: in the case of a company acquisition the buyer is allowed to represent goodwill in its accounts if the book value of the purchased entity is below the purchase price. The generally accepted accounting standards require having the chart of accounts as described in Appendix 1.

- Includes those accounts that are describing the book value of the entity's assets such as tangible assets, current assets, cash and bank, long term financial assets and prepayments
- Includes an intangible account that summarises those assets that are intangible, but allowed to be presented in the balance sheet (e.g. patents, software)

- Includes the most important liabilities that are necessary to determine the company's shareholders' equity
- The chart describes the creation of assets and the patterns of change, it also describes the balance between assets and liabilities.

These accounting rules are extremely important for our analysis, because the axioms behind this logical framework are the points that we would like to modify slightly in order to have an alternative (updated) accounting structure.

The cautious, conservative approach of generally accepted accounting methods is understandable. This only supports those quantifying methods that are fully defensible and reliable, and therefore it provides stability for the measurement process.

5. Alternative chart of accounts

We can capture the value of the company more precisely if we do not distinguish between the creation of tangible capital expenditures, intangible capital expenditures – that are allowed to be accounted for as assets by accounting standards – and other intangible capital expenditures not handled by accounting standards. Moreover the volume of the latter group is more significant than conventional intangibles. Resources invested to intellectual capital – in our view – are basically capital expenditures and not expenses.

Without visualising and controlling this process we cannot manage our company properly. This approach allows us to measure better the real extent of the profit of every period. If we reconsider our cost management framework and costs that serve the development or replacement of intellectual capital items we manage as capital expenditures in intellectual capital items and not as period's expense, we could build up a ground up approach of handling of intellectual capital items. Of course this requires a significantly modified cost accounting framework. In this framework we should make a decision on each and every individual cost item which asset category it belongs, and what the proportion is that could be capitalised (based on its efficiency). Besides this, we should determine the depreciation rule and the impairment measurement of each group of assets, too. This method expands the generally used chart of accounts with alternative accounts (see Appendix 2).

The Figure in Appendix 2 does not include accounts that are not important for visualising the

On the contrary the measurement of intellectual capital is highly uncertain. This is true, but we believe that this should not mean that we exclude any element just because there is uncertainty assigned. If declare any intellectual capital related event as cost related to the current period, we do not allow for the visualisation of certain assets. Therefore finally the total assets we present in the company's books will be far below the real value of the company. As the intellectual capital is growing at an accelerating rate, the proportion of company value presented in the books is getting smaller and smaller and the value based management is becoming more and more difficult due to the fact that the necessary information for decision making is not visualised, and therefore it cannot be obtained.

creation of intellectual capital. These are not influenced by the newly introduced elements. Neglecting these accounts allows us to simplify the chart, but of course these accounts remain in use. The main difference between the two charts of accounts is that we separated the first expense flow on Appendix 1 into two relevant pieces. In the figure in Appendix 2 we separated those expenses that refer to the creation of intellectual assets (1b expense flow) and we determined the capitalisation of these expenses. This method produces fewer expenses in our profit and loss of the first period compared to the conventional approach, but – in parallel with this – additional depreciation cost should be presented relating to the new categories of assets in each period.

This new cost management approach results in profit reallocation among different periods. The total effect of profit reallocation is zero in the long term (although the costs are redefined as capital expenditures, the newly created assets should be depreciated during the time horizon), therefore compared to the conventional approach this approach creates different foundation for management decisions. This approach could be helpful for management if they see the conventional reports in parallel with the extended reporting. Companies have to calculate taxes based on their conventional accounting statements, therefore the modification of the chart of accounts should not result in neglecting tax accounting information. In the new structure we should be able to visualise both the conventional and the extended accounting information.

The extended accounting approach not only modifies the asset side of the balance sheet but also requires an alternative calculation of shareholders' equity (see Appendix 3).

Shareholders' equity and profit/loss for the year can be calculated in an alternative way:

- With the help of the wide arrows we can obtain the company's shareholders' equity and profit/loss for the period according to accounting standards. In this case we apply cost items of accounting standards, which measure the company's shareholders' equity and the change of shareholders' equity.
- On the side of dotted arrows we determine the company's intellectual assets and its shareholders' equity and profit/loss for the period influenced by its intellectual assets. This method results in different values than the values calculated based on the conventional accounting standards.

This approach results in the compilation of two balance sheets and profit and loss accounts that are alternative versions of each other.

- The balance sheet compiled by accounting standards includes assets and liabilities. Assets consist of intangible assets, tangible assets, long-term financial assets, cash and bank, other current assets and prepayments. Liabilities consist of visible shareholders' equity, provisions, short-term and long-term liabilities and accruals. The balance between the two sides is kept stable.
- The balance sheet that allows us to support the measurement of the company's enterprise value, includes additional intellectual assets, such as internal structure related, external structure related and individuals' competence related elements. These additional intellectual assets are balanced by the invisible shareholders' equity on the other side of the balance sheet.

Management that is used to solely relying on conventional accounting information might be frightened to give up this comfortable framework. The introduction of extended elements however is not contrary to the classic way of reporting, but rather it can provide useful additional information that might be critical for certain management decisions. Besides the calculation of cash flow related information remains exactly the same in both approaches.

Similar to conventional group of assets, the efficiency and obsolescence of intellectual assets is a crucial topic, as well. The method of intellectual asset evaluation should be the same that is used in the case of tangible assets according to IFRS. At the end of each period we have to measure the actual value of our intellectual assets (item by item) and decide upon their impairment loss.

6. Controls related to intellectual capital

The visualisation of intellectual capital is not yet a settled procedure; therefore it is difficult to provide exact guidance for decision-making dilemmas assigned to the topic. Several samples show that if one can misuse something then it will be misused. Accounting standards disallow the application of alternative solutions, because they might take uncertainties into accounting measures. The figures of one of the largest Hungarian pharmaceutical companies (Figure 2) support the difficulties of the visualisation of intellectual capital.

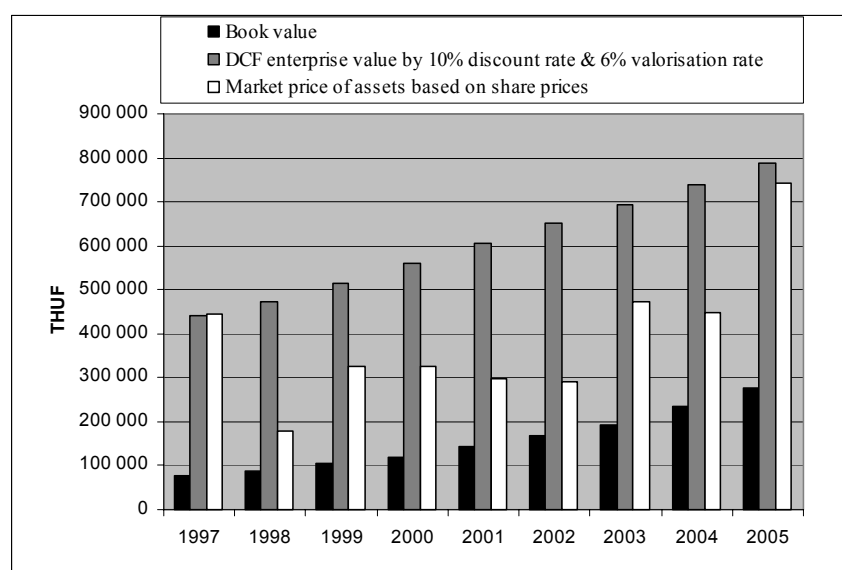


Figure 2: Visible and invisible capital of Richter Gedeon Ltd.

Estimations of enterprise value are very sensitive to prospective expectations. This can be presented by the enterprise value estimated

based on share prices. Stability of enterprise value measured by discounted cash flow (DCF) is deceptive. This is also sensitive to the applied

discount rate and weighted average cost of capital (WACC). Growth of book value is significant and stable. The problem is that the book value is not in the neighbourhood of enterprise value, it is less than the half of the company's enterprise value. An accounting approach that continuously undervalues the company's enterprise value with such an extent could be questionable by this market data. When measuring the company's intellectual capital the management intends to gather information for its own purposes, thus it does not want to give a short weight and cheat itself. Of course, mistakes are always possible. The situation is similar to planning: the planning process is the real value for the management and not the plan itself. Translating it to the company valuation: the base value is the process of company valuation (and the related value based management) and not the enterprise value itself.

The good planner knows that planning is indispensable despite the fact that a plan is often built on some level of uncertainty. Risk management and sensitivity analysis should handle uncertainties during the planning process. The person who deals with measurement of company value has to do something similar: he has to identify the sensitive points of the adopted procedure and work out methods for decreasing the volume of sensitivity. Uncertainties can be managed in different ways:

- The first way can be the methodology of discounted cash flow (DCF) based company valuation. This method calculates enterprise value – total value of assets operated by the company (Mills, 1998) and – based on the discounted cash flows produced by the company in the foreseeable future. In the case of listed companies this method can be completed by the share price based company valuation method.
- The other way can be the alternative (expanded) accounting approach presented above.

Alternative accounting could be an important control instrument. It is possible, that if we capitalise all types of intellectual capital expenditures, which are not allowed to be accounted for as assets by accounting standards, we might get higher intellectual capital value than the difference between the DCF-based enterprise value and the tangible assets would allow. In such a case the intellectual assets might be under managed, or not efficient and therefore their value is not appropriate, thus an impairment should be applied. However, if the intellectual capital calculated during the bottom to top approach is smaller than the difference between the DCF-based enterprise value and the tangible assets, we have another problem that requires action. In

this case we might not have identified some items of intellectual capital which might lead to the under management of these assets without proper management focus.

There are some other instruments – scorecards – that support the managing of uncertainties. These include Skandia Navigator, (Edvinson and Malone, 1997) Intangible Asset Monitor (Sveiby, 2003) and Balanced Scorecard (Kaplan and Norton, 1996). All these instruments try to grasp the efficiency of intangible assets from the point of view of financial result of the entity. During the identification and quantification process of the company's intellectual capital we face significantly larger uncertainties than during the process of identifying the visible (tangible) capital based on the physical assets. In order to support these efforts we need to have scorecards and efficiency indexes. These indexes monitor the company's invisible capital (although they are not measuring it). Basically they all operate based on four viewpoints: financial, (customer/client) relationship, organisational and human. The general rule is that if the value of capitalised intellectual assets exceeds the intellectual capital measured by DCF, the value of scorecard indexes will be unfavourable. This might help a lot in the management of the elements of intellectual capital. The use of scorecards might be a cost effective way of monitoring intellectual capital elements. Overall the annual itemised review (audit) of intellectual assets cannot be avoided by the simple use of scorecards.

The detailed monitoring of intellectual capital will require a lot of resources (both money and time). A profit-oriented company will undertake itself to these additional tasks only if the additional costs and efforts increase the profit and make cost management more efficient. This method provides a basis for the consistent valuation of a complex asset base that is fundamental for an effective cost management framework. Management can control a company's costs only if it is fully aware of the characteristics of the company's assets (including cost of operation and profit generating capability). Due to the fact that the majority of the assets are intellectual, we cannot have an effective cost control environment without having controlling the management of intellectual assets. The new approach gives additional responsibility to the management, thereafter they need to operate based on extended return indexes (such as "ROCA"³) instead of the old indexes (like ROA⁴). The former deals with the modified profit figure and the expanded asset base compared to the latter one. This might significantly change the

3 Return on Complex Assets

4 Return on Assets

decision making process and the general thinking of the management.

This new approach does not mean that we can increase our intellectual capital endlessly, without limits. Ascending capital expenditures in intellectual capital, which is a routinely and mechanically increased capital expenditure, imply the devaluation of capitalisation index (i.e. a worsening marginal utility ratio). So the decreasing proportion of capital expenditures increases the relevant intellectual capital items and the enterprise value. The rest is depreciated (or impaired) during the period, and finally becomes period cost. Identification of intellectual capital items does not mean that the classical efforts to reduce costs are useless. We cannot avoid the cost efficiency steps with capitalisation of expenses as intellectual assets, either. Parallel with the calculation of intellectual capital items we have to elaborate the continuous examination of

efficiency of these new assets. The effect of an intellectual capital structure controlled with efficiency could be the same as the effect of a well thought out cost reduction and cost control procedure.

7. Examples of axioms that need to be rethought

Every economist is aware of the following two definitions:

- Variable costs are costs that are changing proportionally as the production level is changing
- Fixed costs are costs that are not dependent upon exact production level in a given range of production

Relating to these definitions the following chart is often presented (Figure 3)

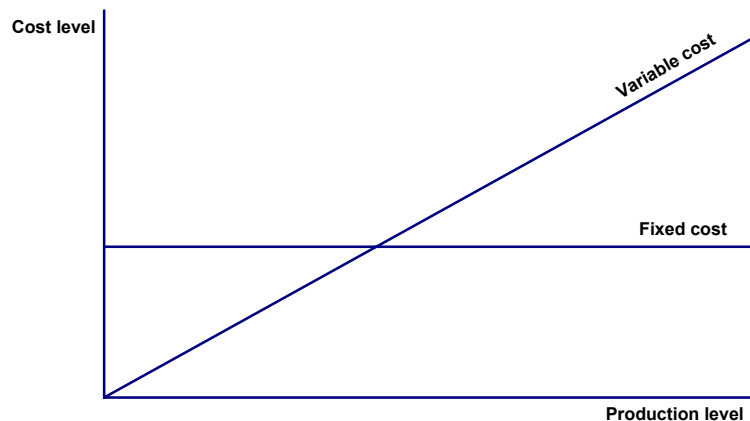


Figure 3: The conventional interpretation of fixed and variable costs

This approach is in harmony with the focus areas of conventional accounting. In this respect this simplified approach might be adequate; however those who continuously face management

decisions are aware of the fact that the real characteristics of costs are more complex. The next chart (Figure 4) is presenting the nature of costs in a more complex way.

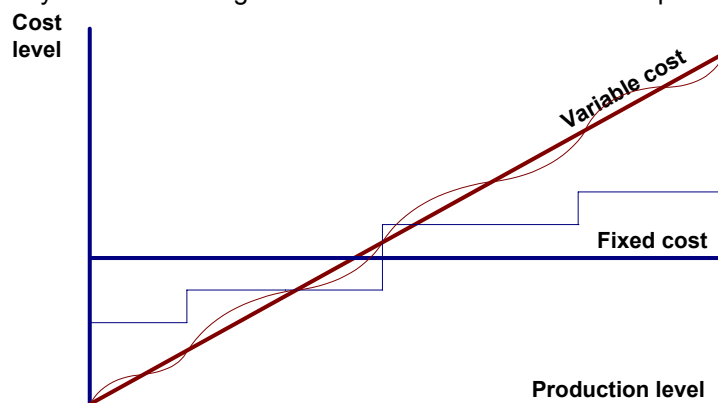


Figure 4: Fixed and variable costs based on empirical observation

It is obvious that even the so-called fixed costs are subject to change as the dimension of production expands. Of course this does not mean that they share the characteristics of

variable costs that more flexibly and quickly react upon changes in production levels. Fixed costs however are likely to change slowly and gradually as production level is changing up- or downwards.

This is why the previous definition contains the “in a given range of production” section. The main difference of the two cost categories therefore is mainly the way they change and not whether they change. What is perplexing in the definition of fixed cost is the missing element of what this cost is depending on. Answering this question is extremely important for a manager who intends to control the overall cost level of his company.

Regarding variable costs, there is no direct proportion between the changing level of production and the sum of variable costs. As the production level increases, the sum of variable costs is likely to follow a sinus curve set alongside a straight line. The level of incremental increase is likely to vary as we progress with increasing production level. This is due to the fact that even variable costs are influenced by the capacity of production (in the form of fixed assets as conventional accounting describes). The following chart (Figure 5) describes the complex relationship among cost categories and capacities.

As we move in time alongside the horizontal axis and we follow the increasing level of production in Figure 5, we see that a certain mix of physical and intellectual assets is necessary for the start of production. As we move on, it might be necessary to obtain new assets. The purchase of assets –

whether physical or intellectual – requires money, therefore we move this liquid asset to another asset category. This is considered to be an investment in conventional accounting therefore the amount spent on the acquisition is capitalised. We can account for costs after the new asset has commenced its operation. When we start our production we are sacrificing certain resources for future revenue (and of course profit). The use of capacities (assets) requires two types of sacrifice:

- Cost relating to the operation of capacities (assets)
- Cost relating to the fact that we are keeping and maintaining these capacities (assets)

The operational costs of capacities (assets) are obvious: we need energy, certain materials and labour costs to have these capacities (assets) operating. The second cost category is necessary because the capacities (assets) are wearing out as we use them: we need maintenance, repair and replacement. Two special – and very important – elements of this cost category are depreciation and amortisation. In case the capacity level is steady in a certain period of time, the characteristics of the first cost category is similar to variable costs, while the characteristics of the second category is similar to fixed costs.

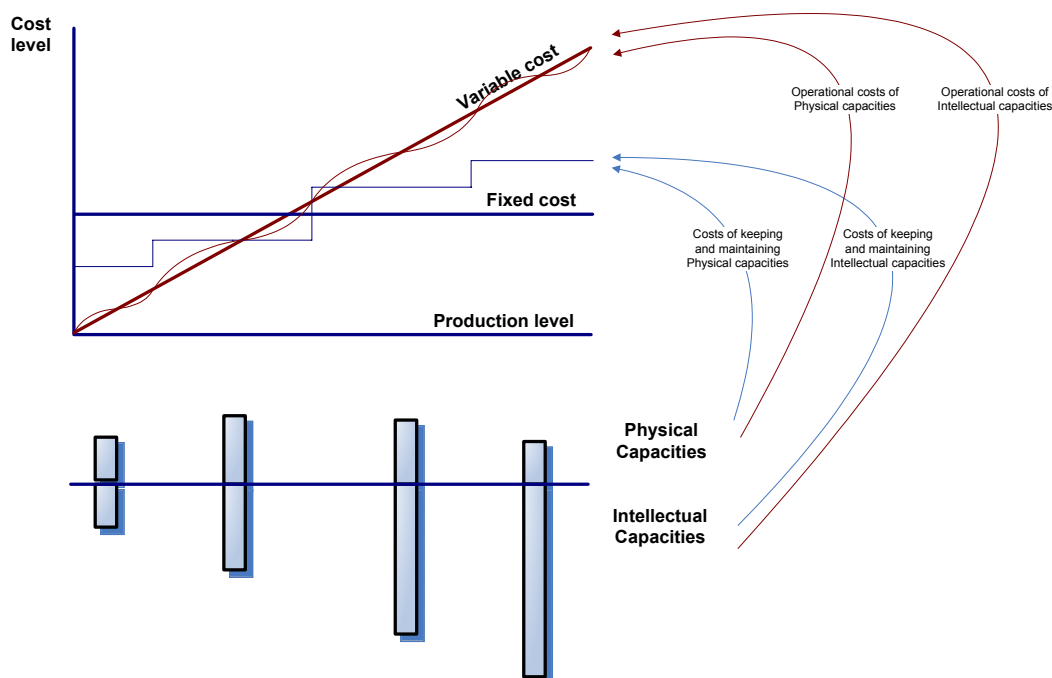


Figure 5: Relationship among costs and capacities

We should not forget however what we saw of variable costs in figure 4: there is no direct proportion between the production level and the sum of variable cost. When putting this to the context of capacity (asset) related cost, we should note that there are levels of production when the

use of capacities (assets) is not optimal: when we reach the limits of capacities (assets) – either upwards or downwards – the incremental cost of an additional unit's production will increase. So far we have mainly referred to production related capacities (assets). Are these statements

applicable for administrative functionalities (like sales and general administration)? Capacities in administration have similar characteristics as in production. These capacities are kept for supporting the core operation. Significant portion of capacities of administration (and sales) are human capacities. The use of these capacities is similar to capacities in production. The two capacity related cost groups are also identifiable. Cost relating to the operation of capacities of administration (and sales) is acting as variable costs, while the cost of keeping and maintaining capacities of administration (and sales) are acting as fixed costs; similar to capacities in production. The advantage of alternative accounting is cacheable in case we intend to understand the complexity of cost categories and we intend to make effective decisions relating to costs. As figure 5 describes, overall cost level is increasing significantly in case we increase our capacities (regardless whether they are relating to front office or back office functionalities). For effective cost management we need to be aware of the exact characteristics of our capacities (both tangible and intellectual). This allows us to judge what is the effectiveness of each individual capacity item (or item group) and what is the value added to profit generation. In conventional accounting environment we could only concentrate on certain capacities, the elements of intellectual capital (as we saw it on Figure 1) remain hidden. For an effective cost management we need an extension to alternative accounting in order to include all capacities (assets) that are related to the operation of an entity. By using alternative accounting we:

- Introduce new asset categories to our balance sheet
- Work out the itemised view on the new asset categories
- Define and use an upgraded accounting policy that handles the new categories and support the visualisation of their fair value
- Reconsider our cost management framework
- Put fixed and variable costs to a new context
- Link cost categories with capacities (operating vs. keeping the capacities)
- Put all the previous points to one overall framework

8. Further steps

Based on research carried out so far, it is clear that the introduction of alternative charts of accounts and the quantification of the intellectual property elements would cause debates among financial experts and academics. The level of uncertainty assigned to the valuation of individual intellectual property items, the depreciation and impairment process related to these elements and the inclusion of this approach into everyday management decisions are areas where further investigation is required. We would like to open a debate that requires the involvement of both acting management accountants and academic researchers, with the aim of identifying those elements of the approach that need further research. Through the development of this conceptual framework we expect to work out a general approach for the introduction and continuous use of alternative charts of accounts.

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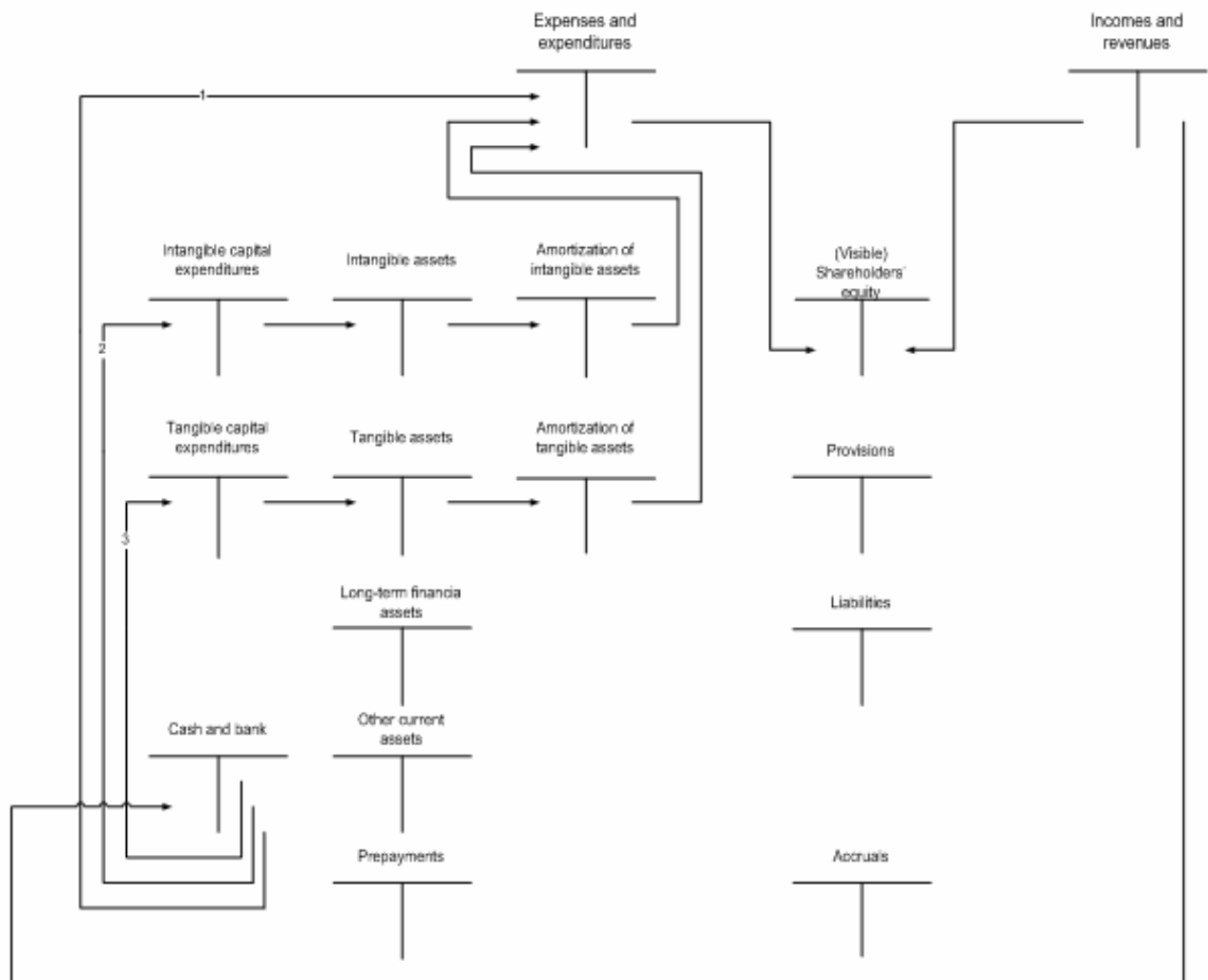
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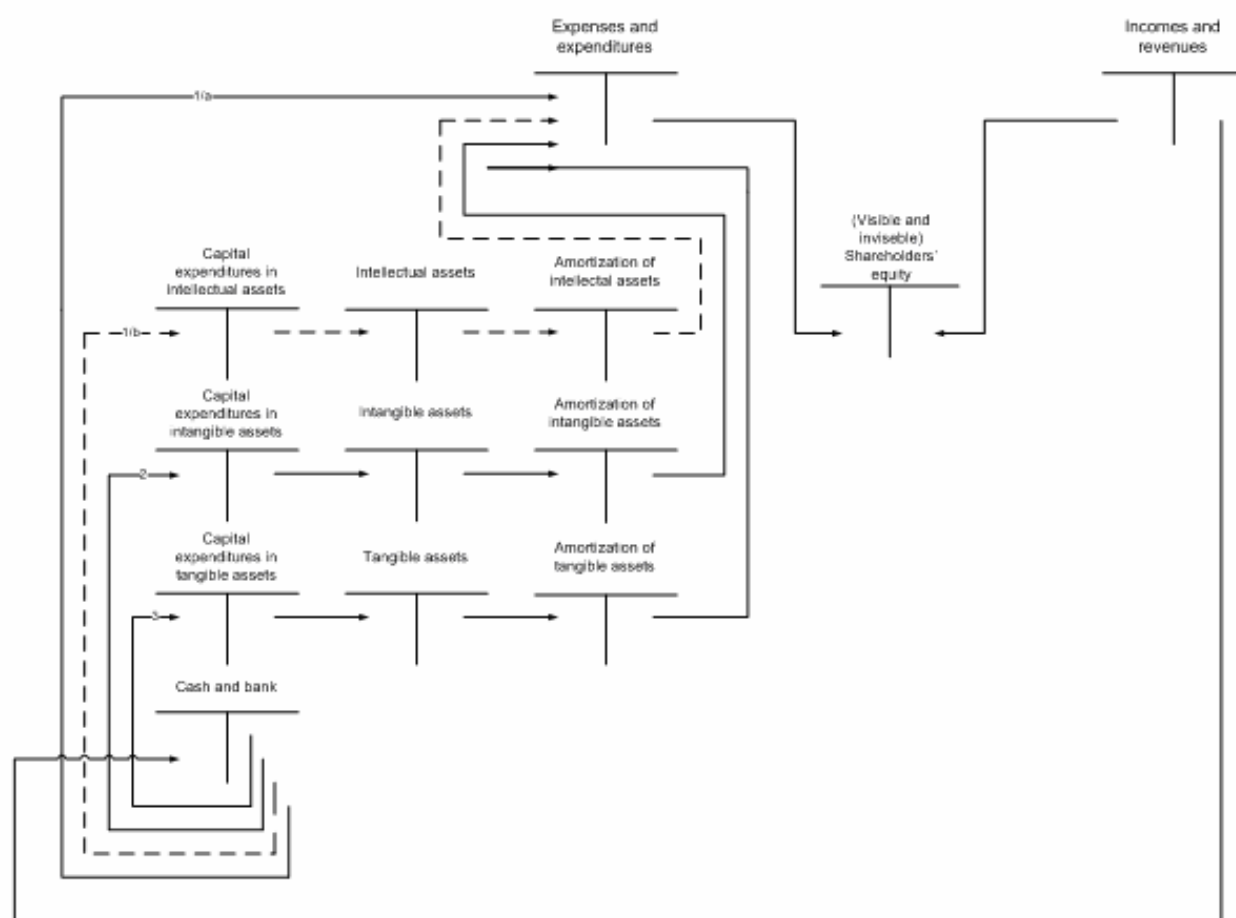
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Appendix 1 - Chart of accounts according to the generally accepted accounting standards



Appendix 2 - Chart of accounts expanded by alternative accounts



Appendix 3 - Principle of alternative accounting that supports the management of intellectual capital

