Implementing IT Financial Analysis

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Abstract
The highly competitive scenario in the enterprise world associated with the difficult world economic situation drives organizations’ top management to reduce costs. This specially affects IT, since its budget is very often hard to justify. To reduce costs successfully and with long term consequences it is necessary to know where the real costs are. To that effect there are several cost models available.

The problem addressed in this thesis is that although there are cost models that can identify IT costs, namely Activity-Based Costing, it does not handle direct costs, which also contain a fair amount of information, and models that operate with direct costs do not cope with indirect costs.

The proposal to solve this problem is based on a hybrid cost model that combines the advantages of both and therefore provides better cost information. In order to test the hybrid cost model a prototype was developed and data from a real organization was used.

The results obtained with the prototype led to the conclusion that this proposal makes it possible to determine the cost of activities using both direct and indirect costs.

Keywords: Activity-Based Costing, Cost Reduction, Cost Model, ITIL Financial Management

Introduction
Financial matters assume a highlight position in organizations’ affairs. Organizations are faced with the challenge to adapt to rapid changes in the environment and to use their resources as efficiently as possible, in order to gain competitive advantage.

According to an IDC survey, financial departments recognize that IS play an important part in the organizations welfare [8] by providing means to obtain management information that can improve the quality of the decisions. This situation challenges CIOs to contribute to the business’ good performance, as they must deliver high-quality services, improve IT contribution to the business and innovate, but always under the constraint of having to reduce costs [7]. According to a CIO Executive Council survey, 40% of CIOs reported that they were under "very high" or "significant” pressure to reduce costs [13].
To reduce costs it is necessary to know them. It is necessary to understand expense flow to be able to make decisions that have impact in the future [5, 10]. It is necessary to manage and control costs. This situation makes it imperative to determine the products and services provided by IT and determine their cost, to finally be able to nurture a transparent IT, where cost and value are perfectly defined [4].

In the case of IT, this identification and control is harder to do, since most costs are indirect costs [14], that is, the costs cannot be fully attributed to a single client, product or service.

ITIL is a set of concepts and practices for IT management, development and operations. Included in the various topics that ITIL addresses is IT Financial Management [11]. ITIL defends that IT financial management should be done in four main steps, among which can be found IT accounting. This process enables an organization to calculate the costs of providing IT services with the use of a cost model.

From the various existing cost models there is one, Activity-Based Costing [6], that best fits this purpose. By associating activities with the use of specific IT resources [4], Activity-Based Costing techniques are capable of distributing IT costs in an effective and exact manner [9].

However, an organization does not exclusively incur in indirect costs. Direct costs are a source of information that an organization cannot ignore, just as indirect costs cannot be overlooked. In a situation where an organization has both direct and indirect costs, which is the most common situation, how should it deal with them?

In short, the problem this thesis plans to address is that there isn’t a cost model that can deal with both direct and overhead costs. An organization cannot be limited to use solely Activity-Based Costing to define the value of its activities, since it is incomplete. It does not include direct costs, which represent precious information. However, using a system of direct cost allocation is even worse, since it cannot deal with the overhead costs, which is a crucial part in the total costs.

The research methodology chosen to address this problem is Action Research because this methodology emphasizes the idea that it is possible to obtain better results by introducing changes in the processes that are being studied and observe the effects of those changes [2].

To improve this situation, a hybrid model is presented, which combines both the advantages of using Activity-Based Costing, with the advantages and simplicity of a direct allocation method. Moreover, a prototype that implements the hybrid cost model was developed and tested with data from a real organization that lead to the results here presented.

Related Work

This section presents the topics of interest for this thesis: IT Financial Management, the Direct Method and Activity-Based Costing.
ITIL Financial Management

ITIL is a compilation of documents that assembles a set of best practices to manage IT. These documents are gathered in books that provide guidelines on how to implement high quality IT service delivery and also the necessary structures to support it. Among the best practices presented by ITIL there is a section dedicated to the financial management of IT. This process considers four activities. They are budgeting, accounting, charging and reporting [11, 14].

The budgeting activity allows the organization to predict the necessary funding to manage IT for a determined period, assures that it is possible to compare actual spending with the predicted ones, at any time, and reduces the risk of overspending, by passing the limits defined in the budget.

Accounting is extremely important, since it provides management with the information that explains the costs of delivering services by IT. This information is crucial to guarantee that the quality of these services is aligned with the spending that has been done to provide them.

Charging allows calculating the total cost by business unit and that data can be used to charge the services provided to clients. This activity allows regaining the costs of providing services, directly from the client that used them and run IT as a common business unit, if necessary.

The reporting activity consists in resuming the information about the costs of services provided and can be used for business unit management.

The benefits of implementing IT Financial Management would influence the user, whom would get better services, the client, whom would get services that are aligned with the business and whose costs are justified and IT would have more financial credibility and maybe even the possibility to transform its savings in investments.

Direct Method

The Direct Method is a very simple cost model. It is a cost allocation method that allocates all costs to all the outputs of the organization’s activity, whether it is an operational department or a product [15]. It ignores service departments and activities, even if they play a part in the realization of the product or provide services for operating departments. All costs are directly allocated to outputs, bypassing any contributions, hence the term direct.

Although this method is very simple and quite affordable for an organization to implement, it is less accurate than other methods, precisely because it ignores all that is between the cost and the output. This leads to distorted product and service costs.

Activity-Based Costing

Activity-Based Costing (ABC) is a concept around which can be constructed an economic model of the business that provides the accurate and relevant cost information necessary to support business decisions of all types [6].
The concept of ABC was developed in the late 80’s by Robert S. Kaplan and W. Bruns [3]. While traditional methods added a large margin of expense to direct costs in order to include the indirect or overhead costs, ABC attempts to establish a cause-effect relation between products/services and the activities, which produce them. This way it is possible to identify which activities are causing the overhead and by discovering these activities, ABC also highlights where the overhead can be controlled [1].

Using ABC is especially interesting in IT where there are many overhead costs and a broad variety of products and services, which is a fact that ABC copes with quite well.

The methodology to apply ABC is as following [6]:

- **Step 1:** Identify and classify activities related to products/services provided by the organization.
- **Step 2:** Determine total cost, direct cost and overhead costs for each activity identified in the previous step.
- **Step 3:** Identify the cost driver.
- **Step 4:** Divide total cost of each activity by products/services according to cost driver usage.

The advantages of using ABC include identifying unprofitable activities as well as opportunities for cost reduction and the information provided helps making better business decisions [12, 16].

**Problem**

The problem addressed in this thesis is that there isn’t a cost model that can deal with both direct and overhead costs. IT departments cannot be limited to use solely ABC to define the value of its activities, since it is incomplete. It does not include direct costs, which are a valuable source of information. However, using a system of direct cost allocation is even worse, since it cannot deal with the overhead costs, which represent a crucial part in the total costs.

To better understand the limitations of both cost models an example is in order. Consider a universe where there are two activities: Activity A and Activity B. Consider also that there are two products: Product P1 and Product P2. Consider now a direct cost (DC) of 200 associated to P1 and an indirect cost (IC) with a value of 500. Using the Direct Method all we have to do is attribute these costs to the products. Product P1 has a 450 cost and P2 a cost of 250.

Although simple enough, is far from accurate. The direct cost is easily allocated to its correspondent product, but there is no defined way to treat the indirect cost, so in this case it is simply divided equally by all activities. One obvious disadvantage is that there is no idea of what activities are performed...
or how much they cost. Therefore it is safe to say that this system does not provide enough information and does not fulfil the purpose of this investigation. Now consider the same universe, where IC has a 50% driver for each activity. Activity A has a 70% driver for P1 and 30% for P2 and Activity B has a 50% driver for each product. The direct cost was incurred while performing Activity A. At the end of the ABC distribution Product P1 has a value of 440 and P2 a cost of 260. The products’ costs show the difference between both models, and although ABC gives a more accurate figure, it is still not correct. Activity A receives costs from DC and IC, which add up to 450. This value is then distributed accordingly by both P1 and P2. This means that the contribution from DC is being allocated to P2 instead of being totally attributed to P1. This situation proves that ABC also does not fulfil the purpose of this investigation although it is excellent in treating indirect costs. Therefore, we conclude that neither one of these cost models is complete enough to solve the problem at hands.

First Research Cycle

The first research cycle is based on a Master’s Thesis developed in the academic year of 2008/2009 with the purpose of controlling IT costs using ABC and sending to each business unit, on a monthly basis, the real costs of IT services used, separated by user and by service [9]. As a result, a tool that implements ABC was developed and tested in the Direcção de Sistemas de Informação (DSI) of Turismo de Portugal. This tool was called Financial Management System and allows the user to manage budgets, costs, services and customers.

Evaluation

In this research cycle the main interest was to evaluate the tool’s effectiveness in dealing with both direct and indirect costs. The Financial Management System allows direct and indirect costs. It handles indirect costs with the use of ABC. The direct costs are represented and count for the customer costs, and it is possible to separate direct cost contribution from indirect. However, the direct costs have no influence in the cost of the services provided, meaning that the value of the services is not completely accurate.

Furthermore, this system is somewhat limited when it comes to data exploration. It answers only the most direct questions. But by being simple, the Financial Management System was quickly learned and accepted by its users. However, its simplicity may be the reason why it cannot accommodate the direct costs, so for the next iteration, a more complex tool will be considered.
Second Research Cycle

There are several companies selling tools based on ABC and SAS is one of them. SAS is a company that intends to turn existing data into knowledge allowing businesses to respond to changes. SAS offers several products in the Financial Intelligence area and the point of interest resides here.

The fact that SAS has such a tool and favours an ABM approach seemed to make it a favourable place to have a good experience. Therefore, SAS was contacted with the purpose of studying its tool, the SAS Activity-Based Management. This is not a free software but the company agreed to provide the software, free of any charge.

Evaluation

The purpose of exploring SAS ABM was to understand if its data exploration power could make it possible to separate and evidence the influence of both types of costs in the service costs.

This tool allows both direct and indirect costs and SAS ABM gives the user a wide range of possibilities. The fact that the user can use cubes to explore the data and is not limited to one view is quite an evolution from the usual cost information. Also the possibility of having \( n \) levels and the ability to intersect them is without a doubt a striking feature.

SAS ABM is a professional tool and the help of an expert makes a significant difference for its users to be acquainted with and to use it in its full potential.

The time reserved for this experience was not enough to design a model that would highlight all the benefits of using a professional tool, therefore the model used in this experience cannot cope with direct costs.

For the next iteration it was decided to try a new approach, one that involved thinking of the problem from the beginning and propose the solution from there and not from an existing system.

Proposal

The theoretical model that supports this proposal is based on the ABC model. It consists of a sequence of levels. Drivers, as in ABC, relate each level to the next. Although ABC only considers three levels, this model can be augmented with as many levels as needed, as long as there are drivers connecting them. The costs’ total is used as a control figure to guarantee the distribution correctness.

To achieve the correct distribution, we must first allocate direct costs. Direct costs have priority over indirect costs so that they can’t influence the ABC distribution. In the first level it won’t be noticeable, but in the following levels it can lead to distortions.

A direct cost has the indication of the instance in a level where it should count. It also has the information of all the instances in the previous levels where it should count. This information is crucial to get a correct distribution.
If we don’t allocate direct costs first they will be distributed in ABC and won’t be entirely charged in the correct instance.

After direct costs are attributed we will proceed with the ABC distribution. The ABC will distribute all indirect costs to the right instances. The sum of the direct and indirect costs for each instance will give the cost of the instance. When distributing costs to the next level, we must repeat the same steps. First we must allocate the direct costs, independently of where it was previously allocated and how the previous instance is related to the instances in the next level. Then we continue with the ABC distribution, but before doing it, we must note that part of the instances’ costs have already been distributed, so we must subtract all the direct costs from the value of the instances and distribute the result of the subtraction. For the next level, we apply the same procedure.

As an example, consider a model with three levels, the first being the Cost Level, then the Activity Level and finally the Product Level. All drivers are represented as a percentage, although the model accepts other types of drivers, just like ABC.

Using the example from the Problem section we will perform a distribution using the hybrid cost model. The Cost Level will have two instances: DC costing 200 and IC costing 500, which amounts to a total of 700. The drivers’ quantities for IC are 50% for each activity.

We will begin the distribution with the direct costs. That means DC is the first to be assigned. Since it is a direct cost, it only has one activity associated and that is Activity A. This activity now has a cost of 200.

The next step is distributing the indirect costs. As ABC indicates, the IC cost is distributed for the various activities using the cost driver quantities indicated. This means that Activity A now has a cost of 450 and Activity B a cost of 250. Now that all costs are attributed we check the total cost in the Activity Level, which is 700.

For the next step of the distribution, it is known that Activity A has driver quantities of 70% and 30% for Product P1 and Product P2, respectively, and Activity B has driver quantities of 50% for each product. This is the point in the distribution where the hybrid cost model differs from ABC. The direct costs are first attributed to their respective products, independently of the activity where they were attributed first. In this case, it means that P1 has a cost of 200 that comes directly from DC.

Now that all direct costs have been attributed using the Direct Method we have to do the ABC distribution. When distributing Activity A, with a value of 450, it has to be taken into account that part of that value was from DC. That means that the direct cost value has to be subtracted from the activity’s value that is to be distributed. This means that Activity A will only distribute 250 of its original value in the ABC method. This results in P1 receiving a cost of 175 and P2 receiving a cost of 75 from Activity A. Activity B has no direct costs in its value, so the total activity cost will be distributed. That means that both products will receive a 125 cost from Activity B. The totals are now 500 for P1 and 200 for P2, which add up to a total of 700.
Third Research Cycle

Company X is a real world company in the IT consulting and software development market that wanted to implement a cost model that would give better cost information and was especially interested in ABC. They used the Direct Method to define the cost of their products. This means that there was a lot of information about their products that could not be lost with the implementation of a new cost model.

Action

As soon as it was established that both parts had an interest in an experience in Company X, it was decided that the researcher would spend a few weeks in the company. This would ensure contact with the problem. There would also be daily meetings with management allowing a better understanding of the expectations for this project.

Once the model was defined, the next step was to gather costs from a certain period of time. It was also necessary to have a list of projects, but the crucial part was to define a list of activities. Since this company used the Direct Method, the costs and the projects were easily accessed, but defining the activities would be a more complicated task. As a starting point, the company’s ERP was used. Company X has a project management system incorporated in the ERP where employees indicate, for a certain period of time, the task they were working on. This list was analysed and irrelevant tasks were eliminated. The remaining tasks were grouped into activities, which were given to management for validation. Another important issue was the definition of drivers. Again, using the information in the ERP it was possible to associate time to tasks, and consequently activities, therefore achieving a simple driver for the various activities. As for costs, the drivers were found through interviews that took place during meetings.

During the meetings with management the context where the model would function was also an important issue. The levels that were going to be used had to be decided in order to design a hybrid cost model that would mirror Company X. The model was subject to the company’s management evaluation almost on a daily basis. This allowed the management’s feedback to be quickly incorporated in the proposed solution. After a few more meetings, a suitable model was achieved and tested in Excel sheets. Once it was approved, it was decided to implement the model in the form of a more satisfactory prototype.

The prototype was implemented using the OutSystems Agile Platform. The prototype is the implementation of the hybrid cost model with three levels, the same levels mentioned in the Proposal: Cost, Activity and Product.

A sample of costs, which included direct and overhead costs, were used as input for the prototype. Using the prototype it was possible to obtain information from both direct and overhead costs. Both types of costs are listed and it is immediately possible to see to which products the direct costs are associated. The prototype also showed the costs for the activities defined. The costs for
the activities were obtained from the distribution of indirect costs using ABC and the contribution from direct costs. It was also possible to obtain the cost of each project.

The use of this prototype and the data from Company X allowed seeing the different contributions. Indirect costs were used and distributed and direct costs are seen contributing directly for a product, but also correctly contributing to the value of an activity. This type of information allows the company to define the correct value of its activities and products.

Evaluation

When evaluating this model, there were two perspectives taken into consideration. According to the investigator’s point of view, this is a successful hybrid cost model, since it fulfils the main requirement, which is to deal with both types of costs. The model copes with overhead costs performing an ABC distribution and with direct costs associating them to the correct product and to an activity. Also there is no duplication or loss of costs while calculating a correct distribution.

According to the client’s point of view, here Company X, the proposed hybrid model is a contribution to solving the problem. It is a cost model based on ABC and with the advantages of ABC, namely the information that is extracted from the overhead costs, but that allows to maintain and use effectively the information they already had from the Direct Method. It is also a simple implementation that provides two different ways of visualizing the cost information. It also provides a cost for the activities performed. With this information it is now possible to act on it.

Conclusion

One of the biggest challenges for enterprises today, and IT specifically, is to reduce costs. To reduce costs it is necessary to identify and control them. In IT it is not as straightforward as usual, since most of its costs are indirect costs, that is, the cost cannot be attributed to a single client, product or service. ITIL provides a set of best practices to do IT financial management that includes the use of a cost model to highlight all expenses. The cost models presented in this study were the Direct Method and Activity-Based Costing. Both methods have limitations when it comes to deal with the type of costs that organizations have to deal with on a daily basis: direct and indirect. To solve this problem, a hybrid model was proposed and a prototype was developed to test the proposed solution. This proposal was evaluated with data from a company and it was possible to see the flow of both types of costs. Most important, the prototype showed both direct and indirect cost contributing to activities, allowing the company to define a more accurate value for its activities and products. The information from this cost model can and should be used to make decision regarding the quality of the services or products.
Future Work

In the future it would be interesting to research the advantages of combining the information from this hybrid cost model with the power of the multidimensional analysis provided by Data Warehouses.

References