

# IT portfolio management

– A banker's perspective on IT –

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## Introduction

In the United States the so-called Clinger Cohen Act has been passed. This act compels government decision-makers to adopt a portfolio approach to IT investments. The great advantage of this is that it forces these decision makers to not only take a short-term perspective, however tempting and understandable this may be, but also to develop an overall vision. One looks at whether the IT portfolio is balanced in terms of risk, technology, pay back period, capital allocation, distribution, and so on. This portfolio-approach is expected to cross the ocean to Europe, but as yet there are few handles that can be grasped to give the portfolio approach a more concrete form.

The financial sector has great potential for the development of knowledge and instruments regarding IT portfolios. After all, the examination of submitted proposals from an investment perspective and the assessment of risk and return are common activities in this sector. Furthermore, information technology plays a significant role in this sector as a production factor, in addition to the personnel factor. The total IT costs for the Dutch banks are estimated at around 20-22% of the total operational costs.<sup>1</sup> Exact figures are difficult to obtain, partly because of the problem of definition – i.e. precisely which costs should be included in the total IT costs? In addition to labour costs, software, hardware and outsourcing costs, R&D and innovation projects, there are the costs of training personnel, failure, fall-back activities, et cetera. The quotient of the total IT costs and the total operational costs is the so-called *IT intensity*. This figure could be used as a benchmark for comparing similar organizations.

## Rising IT costs

In the financial sector, information technology has historically generated huge efficiency advantages. For instance, non-cash payments in the Netherlands are almost fully automated, and this system is seen as the most advanced in the world.<sup>2</sup> It is difficult to fully illustrate and quantify the return on IT expenditure. However, it is clear that IT costs are rising monotonically; in the USA the CIO's predict an average increase in the IT budget of 5.1% in 2003.<sup>3</sup> Where the ceiling lies for IT intensity in the Dutch financial sector is not yet evident.<sup>4</sup>

The trend in the Western European banking sector is depicted in table 1. The realization in 2001 and 2002 may be lower than the prognoses drawn up at that time by IDC on the basis of

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<sup>1</sup> At a National Congress organized by the dutch variant of ComputerWorld, board member of ING Group, Dr. A. Rinnooy Kan, declared that the IT expenditure of the ING Group in 2001 amounted to € 2.5 billion, which is around 18% of the total operational costs of the ING Group. Taking economies of scale into account, we can assume that this percentage will be higher for smaller banks and conglomerates.

<sup>2</sup> See the International ICT survey on electronic payment in 2000, commissioned by the Dutch Ministry of Economic Affairs. The researchers recognize the excellent relative position of the Netherlands but also point out the danger of the dialectics of progress: other countries have more new (promising) initiatives and can operate on a larger scale than the Netherlands.

<sup>3</sup> See [http://www2.cio.com/techpoll/1202\\_techreport.html](http://www2.cio.com/techpoll/1202_techreport.html)

<sup>4</sup> For an interesting impression of the developments in the USA in this field, see: <http://www2.cio.com/research/> and in particular the report "IT-spending and lessons learned".

the replies from their respondents, but the general trend is clear. In order to tackle this monotonic growth in IT costs, many banks and companies are adopting a business-case approach in which the costs and benefits of a (new) initiative are evaluated and in which the risks are also taken into consideration. This is a positive development, but it is not enough.

Table 1. IT expenditure of Western European banks 1999-2004 (source IDC, 2000), in billions of dollars

	1999	2000	2001	2002	2003	2004
Hardware	13.2	14.7	16.2	17.7	19.5	21.4
Package software	5.5	6.3	7.3	8.4	9.8	11.4
IT services	19.2	22.0	25.0	28.1	31.5	35.1
Total IT	37.8	42.9	48.4	54.3	60.9	67.9

### Portfolio approach

The broad field of *quantitative and financial IT portfolio management* consists in effect of four partially overlapping fields:

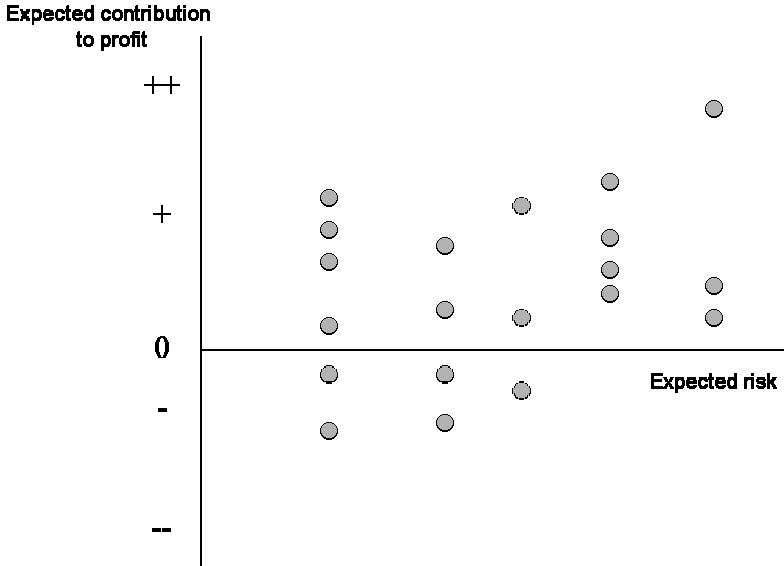
- IT portfolio management, which works with “Markowitz-like” models for IT, introduces balance to the IT portfolio, and works with IT portfolio assessment models and pay back models
- IT investment management: here a more investment-based approach is taken, with the emphasis on Return on investment (ROI), Net present value (NPV), contribution to profit, substitution effects, etc.
- IT performance management deals with the assessment of the operational IT. Relevant subjects are IT dashboard, benchmarks, market conformity, the quantitative aspects of insourcing and outsourcing, SLA’s, etc.
- IT Due Diligence, focusing on the concrete quantification and realization of synergy, reduction of the time-to-harvest, predictability and risk reduction of the integration, reduction of the morning-after-costs, and so on.

Characteristic of a portfolio approach is that a total approach is applied to an entire portfolio of activities, whereby the main concern is to establish a balance between the (expected) risk and the (expected) return. The payback period and the capital allocation constitute part of the underlying approach. It is also important to know whether the portfolio is well-balanced in terms of technology, distribution, company strategy (alignment) and markets. In figure 1 a fictitious example is given of an IT project portfolio. The horizontal axis represents the expected risk and the vertical axis represents the contribution the project is expected to make to company profit. The twenty most important projects are analysed here. This figure illustrates a typical aspect of the measuring of risks in IT projects: the risk is not expressed as a continuous variable but as a discrete variable on an ordinal scale. This means that the risk (x) in the figure only has five values.

It is self-evident that in this fictitious example the attention of the managers should be drawn to the projects below the x axis, which are projects with a negative contribution to profit, and to the projects in the extreme right of the figure. The projects below the x axis would then be assessed on the basis of their necessity. Some projects may be unavoidable, either being imposed by some Supervisory body or enforced in a national or international context (Euro, Y2000, Basel guidelines on risk assessment for market risk, credit risk, operational risk and so on). However, this portfolio analysis also highlighted projects that cannot be justified for these reasons.

This may concern projects that are a legacy from the past, someone’s pet subject or a ‘me too’ project. It is therefore not surprising that companies who adopt an IT portfolio approach have substantially lower costs– see Berinato<sup>5</sup> and Meta Group. Furthermore, the portfolio approach generates concrete improvements in IT performance and creates a far greater value.

Figure 1. Fictitious example of an IT project portfolio analysis: expected contribution to profit versus expected risk



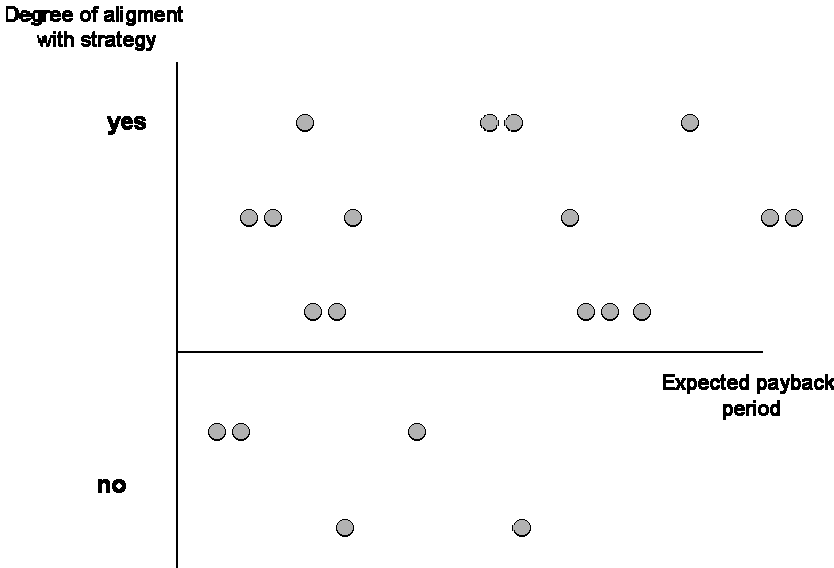
Following this analysis, the projects with a high risk and (sometimes) with a high expected return would arouse the interest of the CIO and the CEO. Even so, an appropriate operational model for these projects could still be imposed, whereby good IT governance is a sine qua non, necessary in order to avoid the risk of damage.

Figure 1 is just a simple example of the analysis of an IT project portfolio. Things become more interesting when Alignment is taken on the vertical axis. Alignment refers to the extent to which an activity is in line with the strategic course of the company. On the horizontal axis the expected payback period of the projects is depicted (see figure 2).

<sup>5</sup> As reported in CIO Magazine: just compiling an IT portfolio database saved one company \$3 million and another company \$4.5 million because the holistic IT portfolio view enabled them to spot redundancies.

Projects that are not in line with the overall strategy attract immediate attention – after all, a dollar can only be spent once. Especially in times of economic difficulty, it is important to focus the available resources to the realization of strategic objectives.<sup>6</sup>

Figure 2. Fictitious example of an IT project portfolio analysis: degree of alignment versus predicted pay back period.



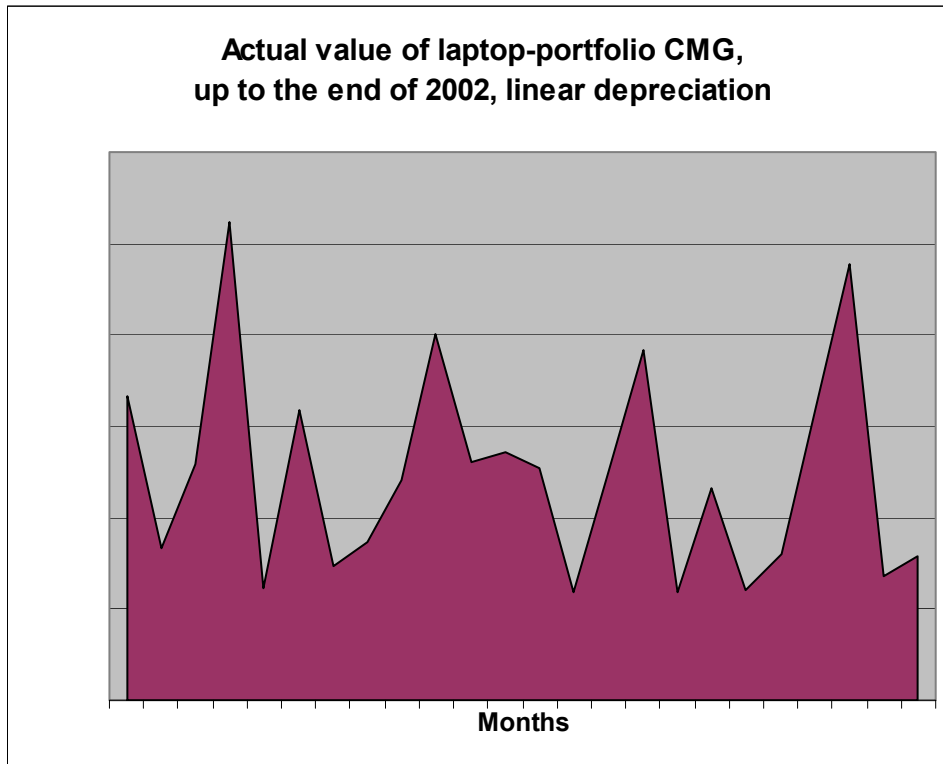
We have now given two examples of the results of an IT project portfolio analysis. This is just the tip of the iceberg, but these examples should give an impression of the type of issues that could be addressed in a portfolio approach and should demonstrate the importance of an *executive approach*. In order to come to grips with IT expenditure, it is important to make a distinction between the various major IT cost components: hardware, software and IT services (including outsourcing fees).

**Hardware portfolio management**

Our know-how and experience regarding the management of and investment in hardware has increased considerably over the years. The investment aspects of hardware are more straightforward, as is depreciation policy. Portfolio management offers additional valuable insights. This becomes evident when portfolio management is applied to insource and outsource operations. Of course, the problem of hardware ‘antiquity’ is often shifted partially to the software, with attempts being made to upgrade functionality in accordance with new requirements. In figure 3, CMG’s laptop portfolio over the last two years is taken as an example of IT hardware portfolio management.

<sup>6</sup> Meta Group strongly shares our conviction in their report on this subject: “IT portfolio management is the cornerstone process for maintaining dynamic alignment between business and the IT organization. Managing IT from an investment perspective – with a continuing focus on value, risk, cost, and benefits – has helped businesses reduce IT costs by up to 30%, with a 2x-3x increase in value.”

Figure 3. Actual value of laptop portfolio CMG up to the end of 2002, linear depreciation (source: LogicaCMG IT portfolio analysis group).



### ***Software portfolio management***

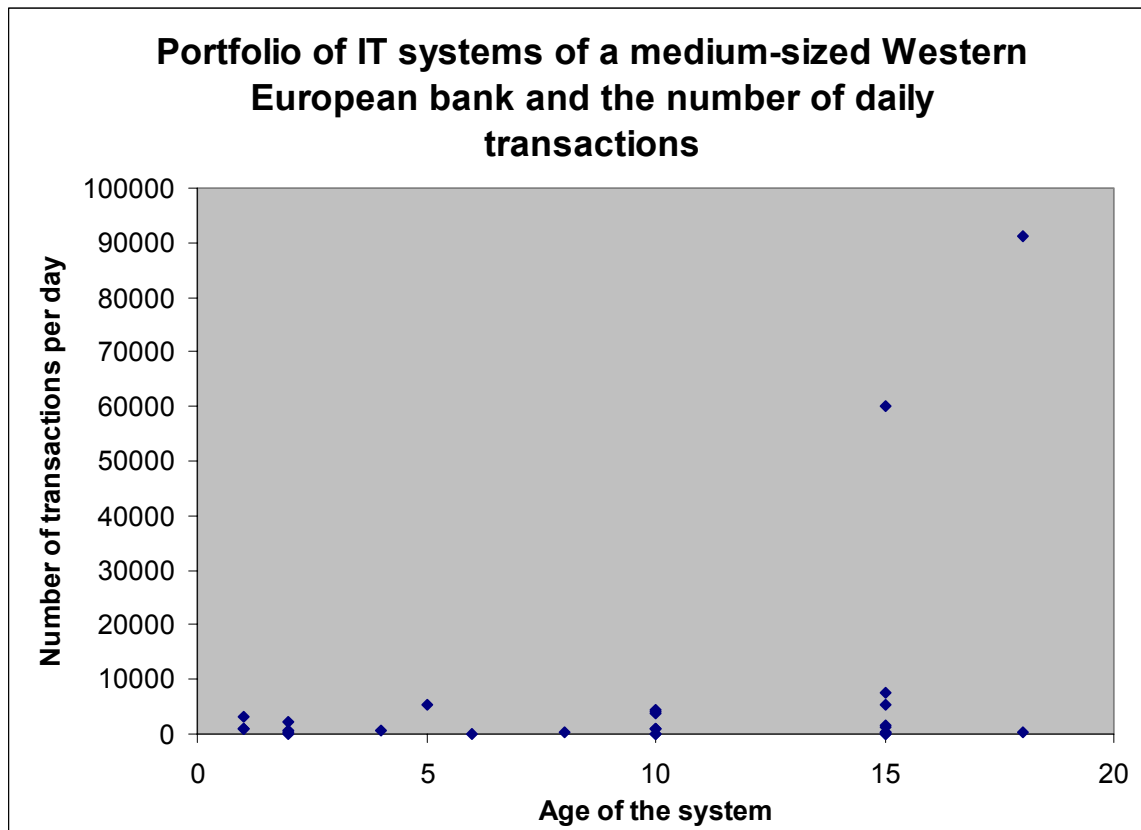
The greatest challenge lies in software portfolio management.<sup>7</sup> Management and development costs are extremely high, diversity is huge, and many of the complex investment decisions taken by managers concern investments in software. We firmly believe that this is the main area in which successes can be achieved in the coming years with a good portfolio approach.

It is often noticeable that mature systems still function perfectly. This is indicated in figure 4, which depicts the age of the systems of a medium-sized Western European bank. The number of daily transactions processed by the systems is also given. It can clearly be seen that the heaviest load is on systems that are over 14 years old. Mass data processing does not rest on new technology but on solid foundations.

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<sup>7</sup> We are not talking here about software packages. These are addressed in license portfolio management where good results can be achieved with optimization techniques. Software portfolio management focuses on tailor-made software.

Figure 4. Example of a software portfolio of a medium-sized Western European bank.



### ***IT services portfolio management***

The outsourcing of IT operations to third parties is strategically an excellent option, but only under certain conditions. One condition is the thorough and sound monitoring and management of the services executed by the new party providing the services. It is also important to agree on the fundamental principles of the outsourcing – in other words, does it take the form of a partnership (in good and bad times) or a client-supplier relationship (dominated by a Service Level Agreement and a long-term contract)? Backsourcing is a commonly heard term nowadays, indicating that the projected benefits are not always reaped.

Portfolio management is relevant to IT services because it assesses the features of the service, the maturity of the service provider, quality, risk, costs and financing.

### **Value for money: ROI, NPV and payback period**

In order to assess the Return On Investment (ROI), the (nett) return generated by an investment is examined on the basis of ‘hard’ costs and benefits. Although investments in IT unarguably have an impact on working conditions and productivity, these ‘soft’ costs and benefits are often not taken into account.

One of the reasons for this is, of course, that such factors are difficult to quantify. According to a survey commissioned by Xerox,<sup>8</sup> over 50% of the respondents measure the return on IT investments partly on the basis of the influence of these investments on their employees and not solely on delivery time and costs. The respondents declared that “an investment is successful if the personnel is satisfied and if working conditions are improved.” However, the survey also revealed that one third of the respondents do not measure the ROI and that one in four of the respondents who do claim to measure the ROI describe this ROI measurement as “weak”.

The notion that an investment is successful if the employees are satisfied and working conditions are improved leads us away from a business economics approach in which the main issue is the payback period of the investment. After all, capital is allocated, the investment involves risks, critical milestones might requiring new (investment) decisions, and so on.

In Verhoef (2002), the ROI of IT projects is examined extensively. This takes into account not only the initial IT costs (which due to their nature are sometimes referred to as a *seismic IT impulse*) but also the maintenance costs incurred by these IT projects. In an analogy with the *seismic IT impulse* these are known as *operational cost tsunamis*. The enormous sea wave that follows an underwater earthquake is called a tsunami and its wavelength is many times greater than the original earthquake in terms of magnitude and momentum. The calculations for the payback period are based on both these components. Making use of public benchmarks the minimum ROI over a period of time was calculated. The analyses reveal, among other things, the great lack of adequate data within organizations, which can be blamed partly on the immaturity of IT in organizations (Capability Maturity Model). In cases where adequate data is available, the long payback time of IT investments is conspicuous.

### **Why Markowitz’s MPT doesn’t work for IT**

In 1990 Harry Markowitz was awarded the Nobel Prize for his work on portfolio theory for securities, also known as Modern Portfolio Theory (MPT). His portfolio analysis begins with the collection and interpretation of information about individual securities and ends with statements and conclusions about entire portfolios. The aim of security portfolio theory is to meet the requirements of the investor as adequately as possible. For the great majority of IT systems within companies the situation is not different. We have to understand the relationships between individual IT projects before we can acquire an overall picture and build an accurate opinion of the IT portfolio.

However, there is a precondition attached to Markowitz’s theory that presents problems when the theory is applied to IT portfolios: the marketability of stocks and shares. MPT concentrates on finding the right balance between risk and return. Theoretically, in MPT there is a curve – *the efficient frontier* – of optimal expected return for a given risk. It is possible to move the portfolio into the direction of the *efficient frontier* by changing the composition of the portfolio by means of investment or disinvestment. For an IT portfolio in a company this is not possible, or is only possible to a very limited extent. This is because the investments have been converted into software functionality adaptations and are no longer marketable. Research is currently being conducted into the adaptation of the theory and methodology in order to cater for this specific characteristic of IT investments.

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<sup>8</sup> Market research agency Mori, 2002, Computable IT foreign news 03/12/02, A different look at the assessment of IT investments, in Dutch.

### **Business cases are good but they are not enough**

Many organizations now apply a business case approach to the decision making process for new and existing projects. The advantages of this approach are that attention is drawn to the business relevance, the costs and benefits are correlated, an insight is obtained into the payback period, and last but not least IT investment decisions are placed on the business side of the organization, where they belong. However, business cases alone are not enough as they often fail to take into account the connection with other projects. A portfolio approach creates an overall picture, revealing whether the total portfolio is in balance, whether or not the investments are one-sided, whether the risks are acceptable, and how the risks relate to the return.

### **Reducing complexity**

IT can be very complex, and it is not always easy for managers within an organization to make keen IT investment decisions. In our opinion, it is not necessary for a CIO to be aware of all the finer points of an IT activity, just as it is not necessary to know all the construction details before deciding on the building of a new head office. The thickness of the floors, the composition of the concrete and cement, the colour of the pipes – these are details that are unnecessary for decision making by a CIO. The CIO has personnel who can help him by taking care of such details and by assisting with the management of IT assets. Reducing complexity and gaining an insight into how IT can help a company to achieve its objectives are essential factors in order to make decisions on the highest level.

### **Research and best practices for IT portfolio management**

At the Free University of Amsterdam, work is currently being carried out on the development of theories and concrete practical methods for IT portfolio management, IT investment management, IT performance management, and IT due diligence. The link between costs and benefits is the central theme. The costs of IT must never be viewed separately from the profits generated by its deployment. Infrastructure, hardware, software and projects are all subjects of this research, together with the accompanying banking themes of risk, financing and capital allocation.

Next to IT portfolio management and IT investment management, we consider IT Due Diligence of major strategic importance. The '*Time-To-Harvest-Synergy*' is one of the most important aspects of Mergers and Acquisitions (M&A). After all, M&A take place in a dynamic world of rapidly changing markets, products and competitors. Combining and merging business processes, distribution channels and IT systems and infrastructures can then make a real and positive contribution to the profits of a new company. However, it shows that the '*IT morning-after-costs*' are often underestimated, and sometimes this appears to be the reason for total integration not taking place, resulting in a weakened competitive position and a deterioration in financial performance. See also Kersten and Evans, 2003.

Modern investors, CEO's and CIO's ask for keen and clear evidence for decision making on IT. They regard IT as becoming a mature production factor in business. Our work, both in research and consulting, yields tremendous insights in IT-portfolio management and thus contributes to a more cost effective IT.

## *Literature*

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