Zeitschrift: Comtec : Informations- und Telekommunikationstechnologie = information and telecommunication technology

Herausgeber: Swisscom

Band: 78 (2000)

Heft: 10

Artikel: Telecommunication investment assessment framework

Autor: Jalalian, Alex

DOI: https://doi.org/10.5169/seals-876487

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Mehr erfahren

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. En savoir plus

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. Find out more

Download PDF: 11.07.2025

ETH-Bibliothek Zürich, E-Periodica, https://www.e-periodica.ch

Telecommunication Investment Assessment Framework

The rapidly increasing competition in the telecommunications market forces the telecommunication operators to minimize costs. Provisioning of new, advanced services through the introduction of modern technology is commonly expected to be a crucial prerequisite for the operators positioning themselves for the future service battle.

ALEX JALALIAN, BERN

The EURESCOM project P901 concentrates on the evaluation of telecommunication investment projects related to establishing new service platforms, such as IP-based fixed or wireless multimedia networks, fixed/mobile convergence, based on new telecommunications technology and new internetworking solutions. The main focus lies on quantitative analyses, relying on the establishment and use of a common assessment framework, including common models for costing, market assessment, competitor behavior and external effects, and risk analysis.

Project Description

The main objectives of the project are:

- Identify relevant approaches and methodologies for the assessment of the economics of telecommunication operator investment projects.
- Model how market response, pricing strategies, handling of uncertainty, strategic interactions between competitors and externality effects influence the economics of telecommunication operator investment projects, in order to enable a unified decision process at the operator organizations.
- Provide extended, quantitative investment analyses of a selected set of telecommunication investment projects, applying the approach and methodology identified and established in the project P901. The selected investment projects are "IP with and without ATM", "Fixed/mobile convergence", "UMTS" and "advanced access networks and services".
- Provide guidelines for applying the selected approaches and methodologies.

Methodology

Figure 1 depicts the overall framework of the investment analyses in EURESCOM P901. The framework illustration is seemingly very similar to investment project evaluation processes in general. The difference and contribution of the P901 framework lies in the implementation of the modules and the inter-working between them.

The scenario definition must be clear and follow the philosophy of the layered architecture, in order to identify the most important parameters and their impacts. In each investment project, a number of relevant scenarios are defined by network alternatives, service portfolio, market segments and external factors such as regulatory issues, competition and demand evolution.

The process of analyzing an investment project is, as stated before, a highly complex and delicate one, due to the tight correlation of many aspects and their mutual influence. Nevertheless, figure 2 depicts a simplistic illustration of the investment analysis process.

In the scheme the main activities involved in the process are boxed and their inputs, outputs and links between the various activities are shown by arrows. The main steps in the process are the scenario definition, the project service and infrastructure planning activity and the calculation of the investment project economics.

Based on the above assumptions, the first steps in studying a new investment is the scenario definition, including the identification of profitable or strategic market areas. Definition of profitable areas, at this stage, is basically the perception of a market sector which can be entered, or where the presence of the company can be empowered, and for which potential earnings are foreseen. On the other hand, the driver for the choice can be strategy based, rather than revenues oriented, in the sense that it may be convenient for the company to invest in a certain project to prevent churn in some market sector, even if the economic value of the investment itself may not be so encouraging. Once the target market has been identified, the next step to set up the project is to define the features of the service or product that will be produced. This task, which generally requires a strong interaction with the marketing area, consists in addressing aspects such as customer perception of the

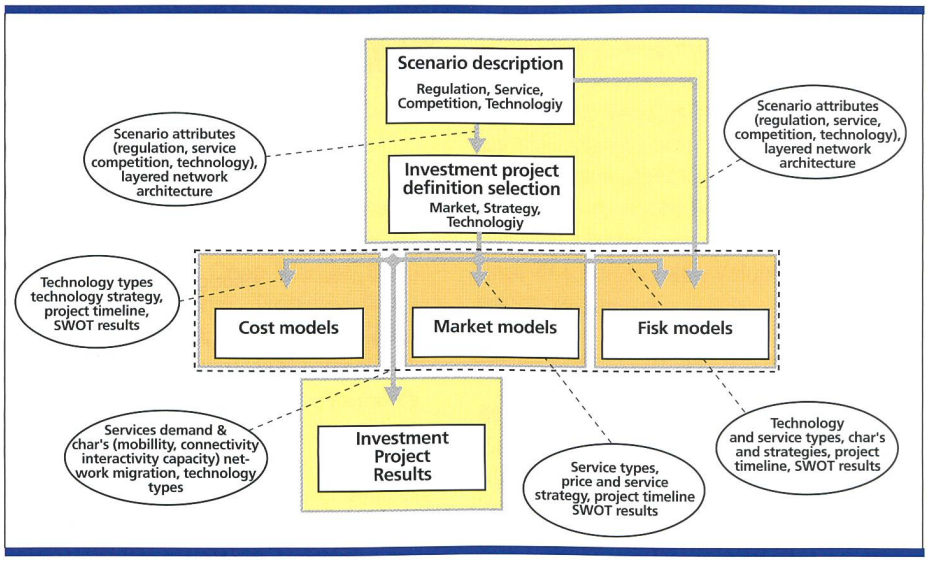

Fig. 1. Module input and output definition.

service (quality of service, latency time, type of terminal etc.) and customer needs (mobility, bandwidth, entertainment, quick operator assistance etc.). Finally, the time horizon for the investment to be assessed and few other financial indexes must be chosen. At the end of this first phase, boundaries of the investment project should be largely defined and the initial setting is therefore completed. Managers can now start the evaluation of the project, activating the planning divisions to investigate on the feasible way, or ways, to implement/produce the identified service/output, to quantify the potential market, to derive costs and so on, until the project indexes are produced.

The project service and infrastructure planning activity (fig. 3) results in the inputs required in the investment project evaluation process. It is, however, important to distinguish between the two worlds of Planning and Accounting, in order to avoid confusion or mismatching of the outputs.

The planning activity is the whole job of putting the project in the right context, with respect to the company, i.e. to identify the best network infrastructure, the operation, administration and maintenance processes, developing a human resources plan, setting up a marketing plan, both to quantify the potential market and to propose the service to the customers (pricing policy). Each and every one of these activities relies on specific methodologies, techniques and approaches, which are case sensitive and non-standard. The overall outcome of the planning activity is a bulk of numbers and non-homogenous data which need to be used to derive the project indexes.

The accounting activity, on the other hand, reorganizes the output of the previous, in order to compute the project indexes. This section gathers those activities related to collecting the numbers from the planning activity, organizing them, feeding and monitoring the process of deriving the final output of the project analysis, namely the cash flows, Net Present Value (NPV), the Internal Rate of Return (IRR) and the Pay Back Time or Period (PBT).

In order to establish a profitable interworking between the two activities, a standard list of elements to be exchanged can be adopted as a common interface among them. Such a list will take into account all the entries needed to perform the numerical analysis of the project, including:

– Investments
– (Variation of) Net Circulating Capital
– Operational Revenues
– Operational Costs
– Depreciation

Each of the above may be further expanded in order to guide the compilers of the list, avoiding ambiguity. It is important to remark that people taking care of the different planning activities happen not to have the economic background to easily deal with accounting criteria. Things like investments and depreciation, for example, may be confused, and therefore circulating the list could represent a guide as well as an educational tool to spread economic know-how throughout the company.

Thus, the definition of a standard interface implies three substantial advantages:

– it stimulates co-operation between different functional units;
– it is a tool to harmonize a company's approach to the economic issues throughout the different branches;

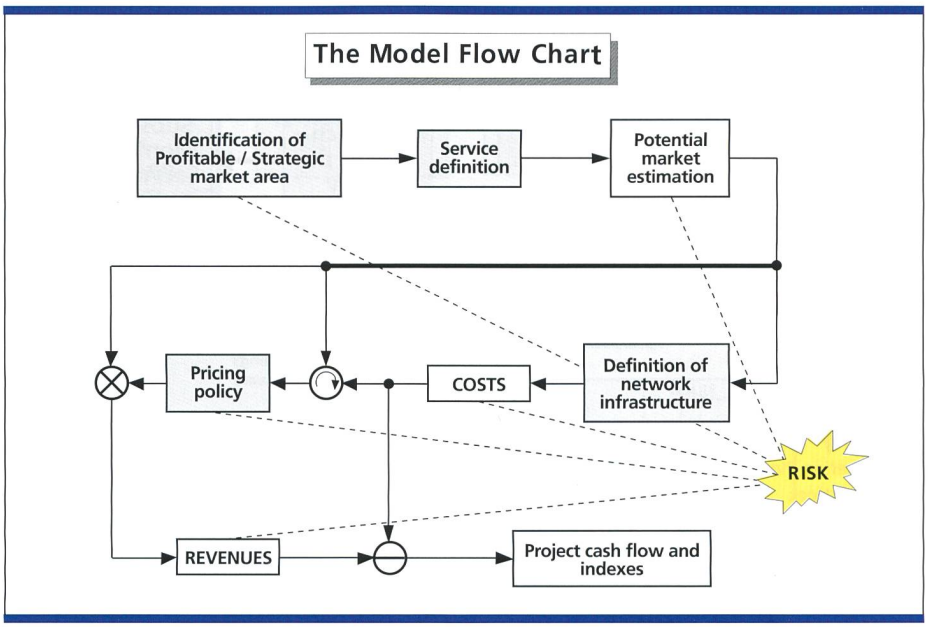

Fig. 2. Investment analysis process.

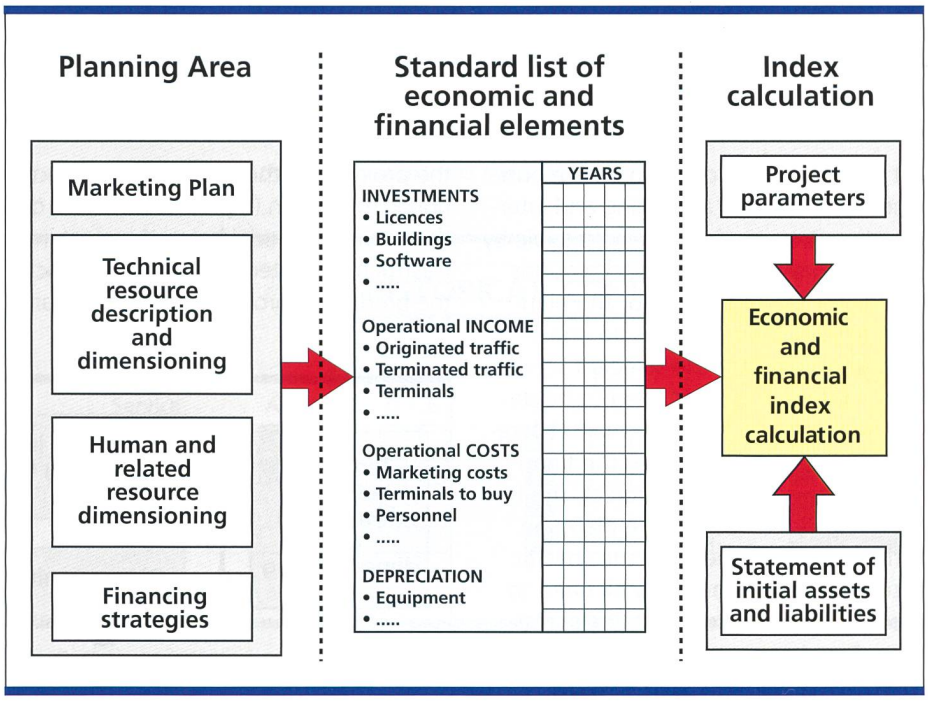

Fig. 3. Example of interfacing the planning activity with the accounting activity.

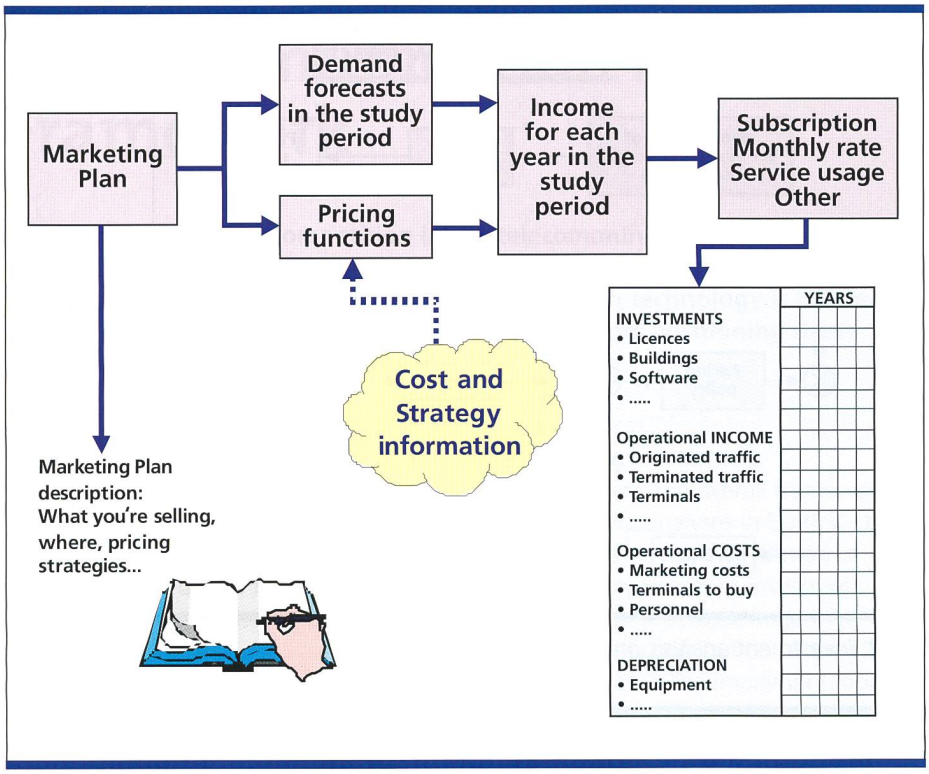

Fig. 4. Workflow; from the marketing plan to the standard list.

– it makes the task of filling up the business plan, as well as reading and interpreting it, a standard one, accessible by people having different backgrounds.

Given the defined scenario, the planning activity then provides an implementation plan for the selected service. Many different aspects need to be developed, ranging from the market forecasts, to the infrastructure, the financial plan to support the project, the human resources. Each of the planning activities is dependent on the specific case under study, but they all need to provide output in terms of costs, estimated revenues and reliability of such forecasts. It is in this field that the model developed in P901 provides particular support, addressing several methodologies and related tools. In the following a brief description of the studied methodologies is given. The marketing planning activities are summarized in figure 4.

Analyzing the market implies facing the future. The market methodologies cover forecasts on potential customers, elasticity, penetration and so on.

The deployment of the infrastructure to support and provide a new service is something strictly related to the project itself. Nonetheless, the planning activities under this umbrella are fundamental to provide both the technical feasibility for the project and the cost basis for its economic evaluation (fig. 5). This section of the economic model being the most infrastructure-related, criteria to approach the productive process and to locate and characterize cost centers within it are discussed. The standpoint of the investor is also taken into account, addressing methodologies which are developed in a forward-looking perspective, as opposed to the historical point of view, and finally the ideas of exploiting economy of scale and scope in cost optimization is briefly treated.

In order to complete the analysis of the investment, the sources for the investments to be made and the reimbursement strategy for them must be introduced. In figure 6 the process of analyzing the financial aspects of the investments is illustrated.

Financial plans are outside the scope of EURESCOM P901, mainly due to the fact that this usually is a very company-specific task, related to the company's operational environment, the particular situation of credit, liquidity, interest rates and so on. Nevertheless, the investment analyses herein described must adhere to the overall guidelines given by the financial aspects of the investments under consideration.

Finally, the investment project economics is calculated. The project indices to be used in the evaluation are NPV (Net Present Value), IRR (Internal Return Rate) and PBT (Pay Back Time or Period).

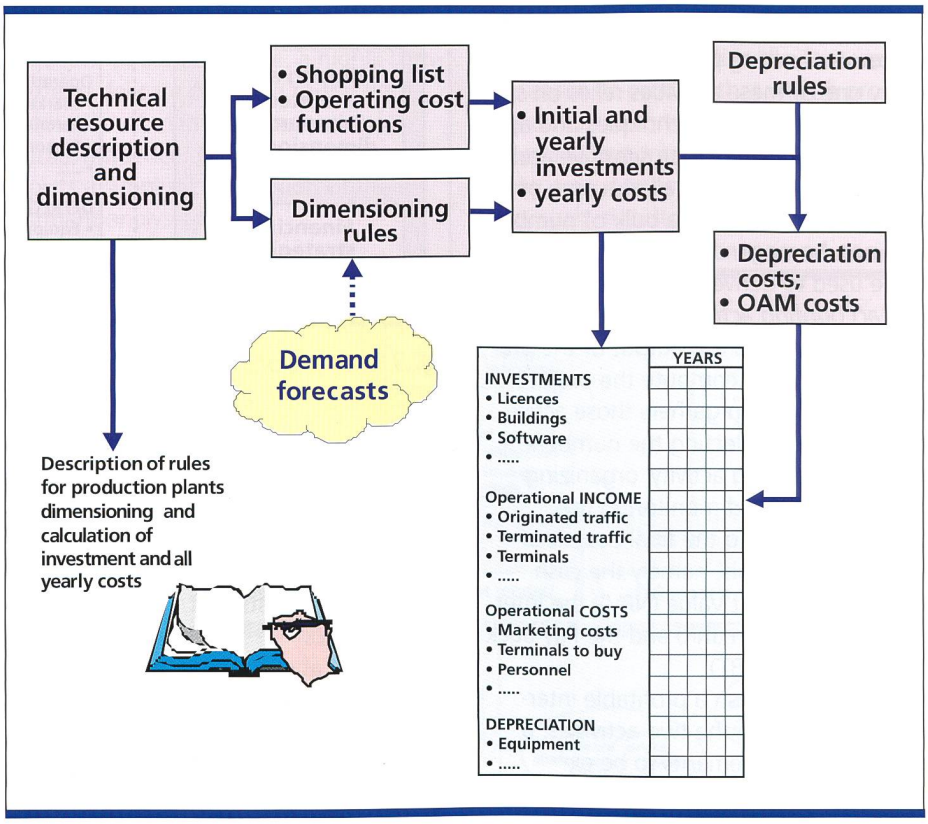

Fig. 5. Workflow; from the technical plan to the standard list.

In order to carry out the investment analysis the project P901 has surveyed several available tools, of which the TERA tool has been selected as the core tool to be applied in the project. TERA is a general tool, not restricted to a specific approach. The costing or financial approach depends strongly on the business case model as chosen and implemented by the analyst, i.e. the TERA user. TERA is based on a collection of Microsoft Excel spreadsheets linked with a Microsoft Access database. The spreadsheets collect the data from the planning activity, i.e. the market forecasts, the infrastructure dimensioning and the OAM dimensioning results.

The main contribution from P901 is the specification of recommended methodologies and models to be used in investment analysis of telecommunication operator strategies. The specification is based on a survey and assessment of relevant approaches and methodologies for the assessment of the economics of telecommunication operator investment projects. The main areas addressed are:

- Investment, Operation, Administration and Maintenance Cost Modeling
- Market Modeling
- Investment Analysis under Uncertainty
- Investment, Operation, Administration and Maintenance Cost Modeling

The principal aspect in setting up a cost system is surely the purpose for which the system is developed. Depending on the different purposes, different costing methodologies, cost bases and procedures to analyze the productive infrastructure are applied:

- Costing for internal monitoring and management
- Costing for external exposure
- Costing for strategic planning
- Costing for regulatory confrontation

However, in EURESCOM P901 the main emphasis is on the evaluation of telecommunication network investment projects, and hence costing methods for strategic planning are the most relevant ones.

The main arguments are: Procedures to analyze the productive infrastructure; cost bases; costing methodologies. The procedures may be:

- *Top-down:* starts from costs indicated in the general ledger and works down through the company productive process to distribute them over the output.

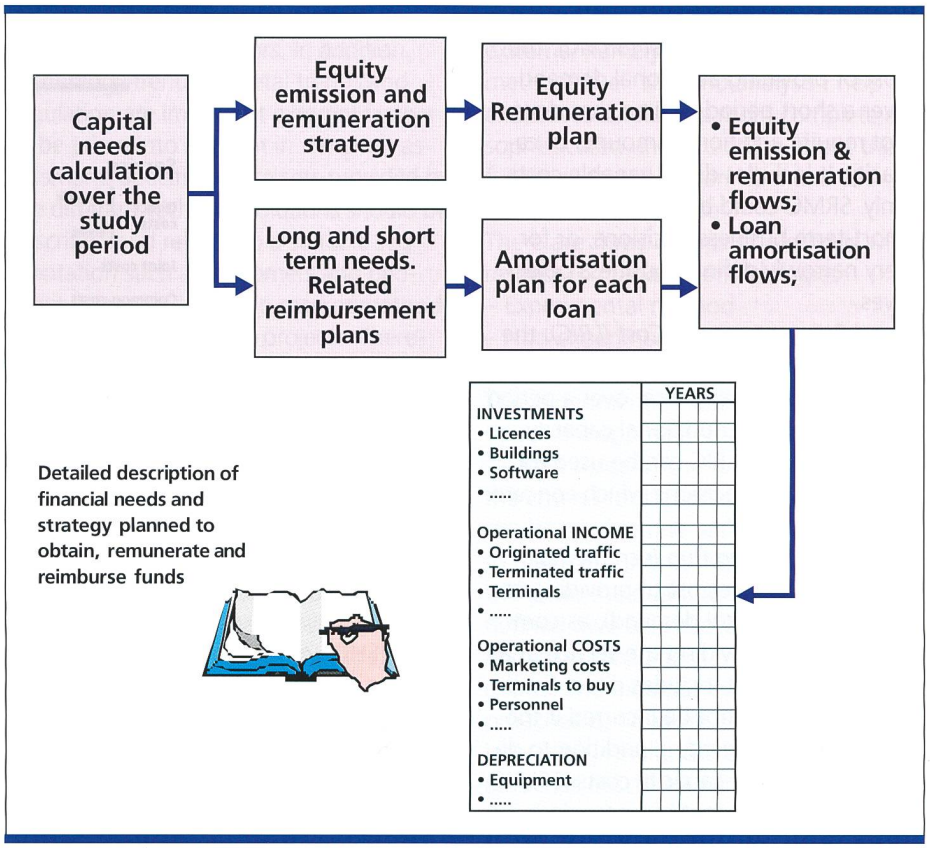

Fig. 6. Workflow; from the financial plan to the standard list.

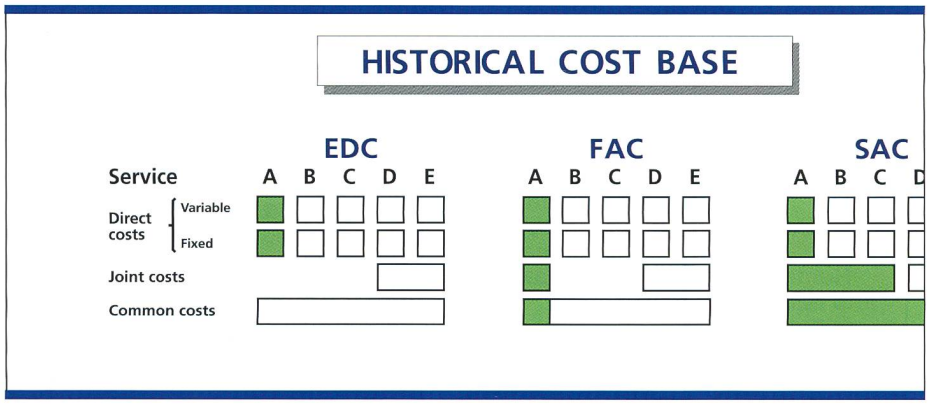

Fig. 7. Comparison between historical cost based methodologies.

- *Bottom-up:* starts from the output to be produced and determines the productive infrastructure able to deliver it. Costs sprig from the dimensioning process, which is finalized to the demand to be satisfied.
- *ABC (Activity Based Costing):* is a methodology that measures the cost and performance of company activities. Resources are assigned to activities and then activities are assigned to cost objects based on their use.

Three different schemes could be applied as cost base (fig. 7):

- *HCA (Historical Cost Accounting):* cost base in which assets costs are the ones that have been undertaken when the goods were purchased, taking into account the depreciation.
- *CCA (Current Cost Accounting):* cost base in which assets costs are assigned assuming that they were purchased at current price. The basis for valuation is the replacement cost of an asset, i.e. how much it would cost today if it were to be replaced.
- *FLC (Forward Looking Cost):* an accounting approach where company properties and goods are evaluated deriving the most efficient productive. This may imply redesigning the productive structure.

The costing methodologies are (fig. 8):

- *Short-Run Marginal Cost (SRMC):* the cost of providing additional demand over a short period of time that does not require additional amounts of capacity. It includes direct variable costs only. SRMC could be used only for very short-term business decisions, or for very narrowly defined business objectives.
- *Long Run Incremental Cost (LRIC):* the cost of providing a large number of additional units of a service, over a period of time in which additional capacity will be needed. LRIC can be used for most business decisions which concern existing services.
- *Total Service Long Run Incremental Cost (TSLRIC):* the cost of providing an entire service (total demand), as compared to not providing the service at all (zero demand). It includes direct fixed costs which will not be incurred if the service is not offered, in addition to direct variable and capacity costs. TSLRIC can be used for most business decisions which concern entirely new services or business ventures.
- *Total Element Long Run Incremental Cost (TELRIC):* it constitutes an evolution of the previous one, defined by the U.S. Federal Commission (FCC) as the TSLRIC of unbundled network elements.

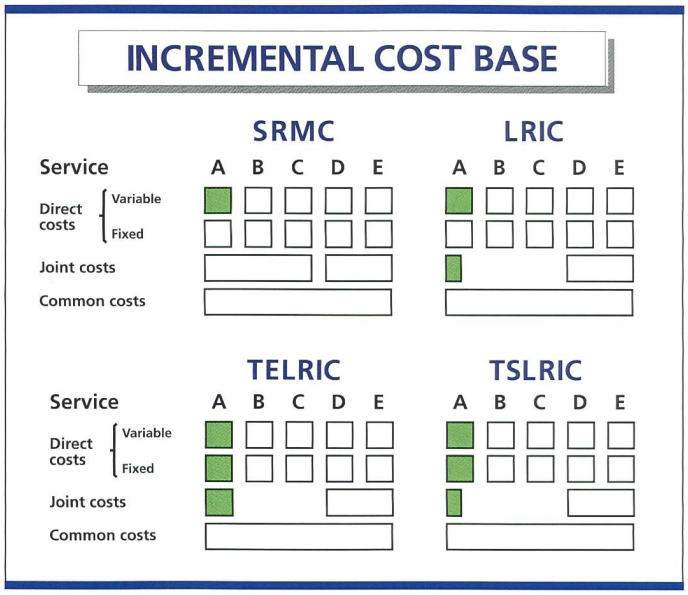

Fig. 8. Comparison between incremental cost based methodologies.

In the following a quick confrontation of the results is presented, dividing the methodologies based on a top-down approach, traditionally adopting the historical cost base (or, eventually, the CCA base) from the ones which typically refer to a bottom-up approach, based on FLC cost base and, with different aspects, to be brought back under the common tag of Incremental Costing.

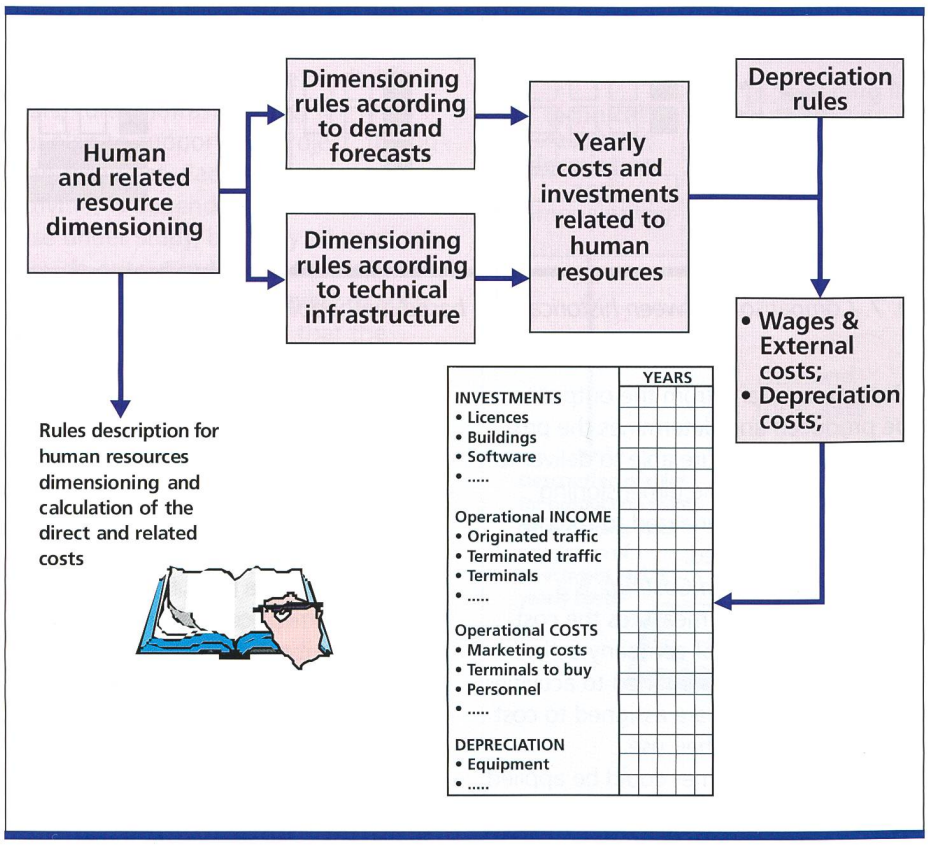

Fig. 9. Workflow; from the human resources plan to the standard list.

Confrontation of the cost methodologies with the purpose of analyzing a new investment leads to the conclusion that Fully Allocated Cost (FAC), Embedded Direct Cost (EDC), Stand Alone Cost (SAC) methodologies are not suitable for such aims, because they start up from historical costs and cost evaluation is not referred to the newest technology.

HCA records costs when they were actually incurred and reflects the mix of old and new technologies actually in use, whereas CCA measures asset values at the Modern Equivalent Assets (MEA) replacement cost based on up-to-date technology and current prices. The CCA convention is therefore well suited for use as the basis for the cost inputs to the LRIC calculations.

Long run incremental cost is a forward-looking concept and so would be reflected more accurately by the use of current cost accounting (CCA) rather than historic cost accounting (HCA).

Among the planning activities, the Operation Administration and Maintenance (OAM) planning is maybe the most delicate. It usually implies estimation of shared and common costs, deals with human resources and seldom is supported by a dimensioning criteria (fig. 9). The procedure identifies the company's activities and layers from which these and other cost factors are originating, as shown in table 1.

Market Analysis Methodologies

The traditional approaches to market modeling often view the world black & white i.e. they assume that the world is either certain, and therefore open to pre-

cise predictions about the future, or uncertain, and therefore completely unpredictable. Making systematically sound strategic decisions under uncertainty requires a different approach. Identifying a range of potential outcomes or even a discrete set of scenarios is possible even in the most uncertain environments.
In this chapter we elaborate on some of the most effective analytical methods used today for different market situations.
Investment projects are initiated both based on new enabling technologies and growth in demand for new services. Very often the causality with respect to market drivers is not very clear. Typically we have situations with both "technology push" and "market pull".
A generic market assessment workflow has been developed within the P901 project. Main market arenas initiating telecommunication operators' investments in next generation networks have been identified, representing expanding "marketplaces" with respect to technologies, services, economy and strategies which, in turn, are expected to have large impact on the future business for telecommunication operators. In addition, technology trends, societal trends and regulation are important external factors to be taken into account in a market assessment. Specific service sets provided by the different technical solutions should be described and related to a suitable segmentation such as customers and geographic areas. Clearly, no market methodology fits all investment projects. Therefore, a suitable market methodology has to be picked, a detailed market model has to be built and forecasts needed for the study have to be produced. The key outputs from the assessment should be how the price and demand for a service evolves as a function of time.
There are several levels of prognoses ranging from those that provide a clear sense of the future to the ones that provide a range of alternative visions that are more or less tightly defined. A classification of different methods with respect to uncertainty is demonstrated in table 2.
The classification "clear future" is associated with relatively stable businesses, where analytical methods like "market forecasting" can work well. At the other extreme, namely "vague future", other methods like "scenario analysis" help the executives establish a more complete and sophisticated understanding about the future and enable them to make decisions about the future.
There are three groups of methods with respect to market methodologies:
– Experimental method
– Non-experimental quantitative analysis
– Qualitative analysis
The experimental method is beyond doubt the approach that provides the clearest sense of the future. Given that the criteria for design are satisfied, the results provide one with the best ability to make prognoses. Moving away from this pole, the quantitative approaches defined here also allow one to make certain assertions about trends and developments. The material from these approaches is, however, less certain and less viable. Finally, the qualitative approaches described here generally fit into the categories of providing one with insight into possible alternative futures or perhaps a range of futures.

Telecommunication layer	OA&M	Provisioning	Churn	Decommissioning	Leased facilities
Customer care management	*	*	*		
Service & Service management	*	*	*		*
Network and system management	*	*	*	*	*
Network elements & system elements	*	*	*	*	*
Physical network and infrastructure (cables, ducts, cabinets, buildings)	*	*		*	*

Table 1. Identification of sources of running cost.

The degree of Uncertainty	What can be known?	Analytical tools	Examples
Clear future	A single forecast precise for determining market strategy	"Traditional" strategy tool kit Market forecasting	Market strategy against low-cost insurgents
Alternate futures	A few discrete outcomes that define the future	Decision analysis Option valuation models Game theory	Long distance telephone carriers' strategy to enter deregulated local-service market Capacity strategies for chemical plants
Range of futures	A range of possible outcomes, but no natural scenarios	Latent-demand research Delphi Technology forecasting Scenario planning (using influence matrix)	Entering emerging markets Developing or acquiring emerging technologies in consumer electronics
Vague future	No basis to forecast the future	Analogies and pattern recognition Dynamic modelling Sensitivity analysis	Entering the market for consumer multimedia applications

Table 2. Classification of methods with respect to uncertainty.

Given the range of approaches one has the tool kit to be used to make various types of prognoses. In general, we point to three groups of methods. Going beyond the categorization of experimental, quantitative and qualitative presented above we can sort the approaches discussed above into three general areas. These include survey and other quantitative methods, qualitative methods, and finally expert groups and the Delphi approach.

The type of approach to be used relies on the time horizon and the nearness to the end user. Generally, the more one moves further from goods and services that will be consumed by end users, the more one relies on expert groups and processes such as the Delphi approach. In the following the key approaches are briefly discussed:

"Time series trends analysis", both basic and extended, the "Bass model", based on cumulative probabilities, and, in particular, some Ordinary Less Squares (OLS) models are used to analyze demand and service penetration aspects, which are commonly taken into account when facing new investment projects. It is based on a wide statistical background and is most suited for estimating the future service penetration and demand. The model structure may be enhanced by including costs, to give useful signposts on price policy, and to yield better results.

The estimation gives us two clusters of outputs, depending on the model.

- *Using the Cobb – Douglas* equation we obtain the parameters' elasticity's (our key variables in the model), i.e.: Price – demand elasticity, Revenues – demand elasticity, Marketing – demand elasticity and Number of subscribers – elasticity.
- Using the Bass model equation we obtain the Potential market size, Innovation coefficient in clients (clients first engaging a new service based on a new technology), Imitation coefficient in clients (the amount of potential clients not pioneers in the service usage).

Both of them are useful for the calculations of the

- Market penetration
- Potential market size
- Sensitivity analysis (in the case of the Cobb – Douglas)

The OLS methodology is applied to time series analysis. This represents a problem when facing short time series (or when dealing with lack of data). However, the longer the series of the key variables the better the estimations.

Although the "Bass model", does not cater for price demand elasticity, its strength for handling the tariffs evolution and sales patterns enables the market analysts to picture a demand evolution for a new service. Within the different models used for the estimations, there are methodological examples with real data for the Telecommunications market in Norway and Spain, as well as estimations for the CATV service in Canada.

The Delphi approach, which is a method of making prognoses, was developed by the Rand Corporation in the 1960's. The Delphi approach is a further development of the expert panel approach in that it attempts to derive a form of consensus from the various experts involved. The results of a Delphi analysis have been used in a broad range of applications and are particularly useful when considering complex systems wherein developments are not comprehensible to the broad public.

The *"Influence matrix"* method provides the means for examining a large number of parameters and identifying the most significant ones (the most active and networking parameters). The parameters could be market drivers, or any other factor impacting our model. The identification of the most significant drivers, for instance, would enable the market strategists to build scenarios and perform scenario planning.

The *"Externalities modeling"* deals with economic issues largely affecting the offer (that is, companies') strategies and, particularly, the demand aspects. Externalities appear when agents' decisions about any consumption or production service affect (positively or negatively)

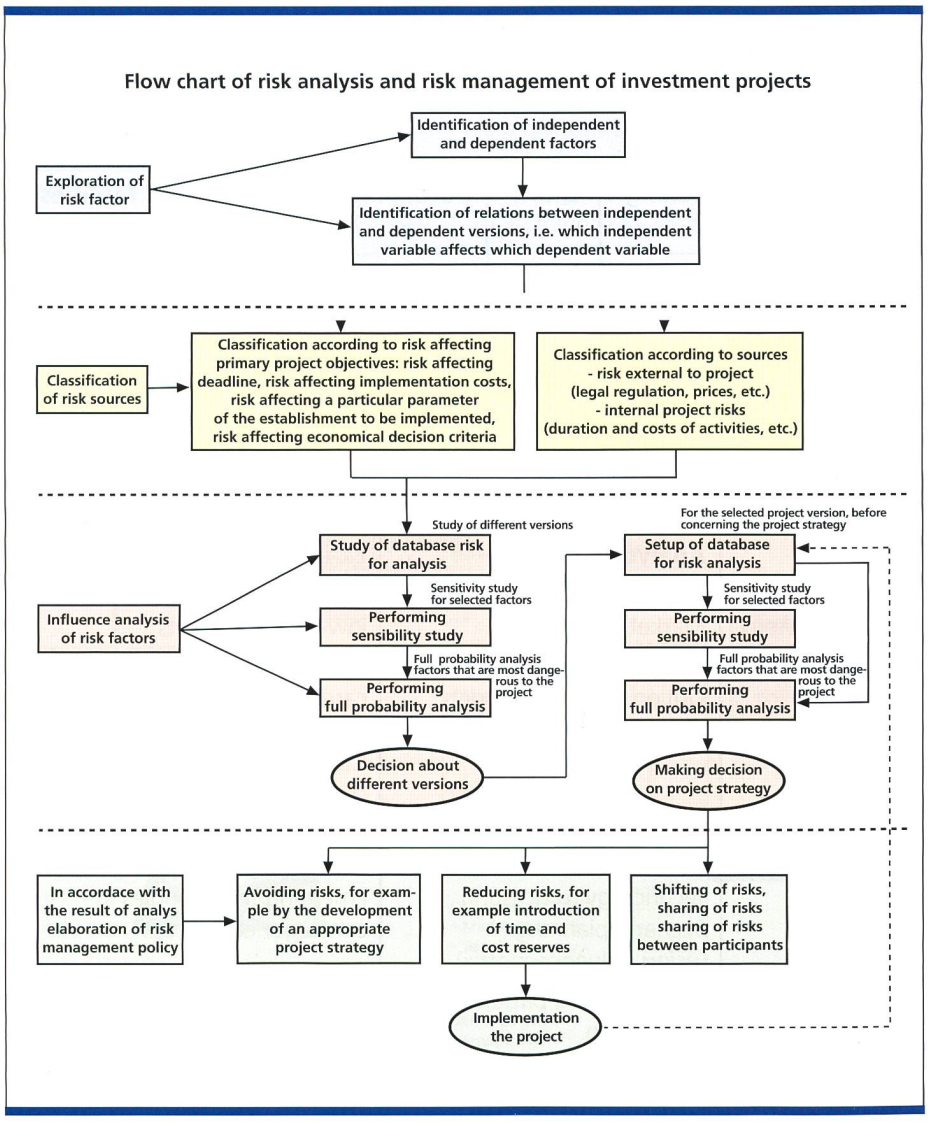

Fig. 10. Flow chart for risk analysis and risk management for investment projects.

other agents' decisions about consumption or production.
Market captures traditionally all the information on prices, but when facing externalities this does not happen, unless the authorities measure it and undertake any policy against that externality (traditionally, case of negative).
Externalities exist on many markets and most of them are unregulated, particularly when externalities are positive. Accordingly, there are some network externalities in the Telecommunications market.
Network externality has been defined as a change in the benefit, or surplus, that an agent derives from a good or service when the number of other agents consuming the same kind of good/service change (i.e., the higher the number of clients using mobile telephones, the better to the consumer as tariffs mobile/mobile are lower than fixed/mobile). The following items summarize the kind of network externalities:
– Critical mass
– Barriers to the entry/exit
– Scale economies.
– Post-purchase services
– Product differentiation
There are three main modeling methodologies in measuring the network externalities:
– *The classical approach.* Taking a willingness-to-pay function for the clients, a parabolic demand function is developed. With that demand function and a cost function, the equilibrium points can be determined, only one of those being a stable equilibrium.
– *The critical mass approach.* This is a particular modeling for the main network externality, the critical mass. The static market equilibrium with respect to the considered externality is defined by five equations: Demand, supply, fulfilled expectations of the network size, fulfilled expectations of prices and the market clearing. The result (it can be both a static or dynamic equilibrium) determines the optimal network size taking the externality effect into account.
– *The TERA approach.* Analysis of economic externalities in TERA is based upon the concept of the regional economic analysis, so as to help in the convergence of the European regions. This approach differs on its standpoint from the classical one and from the critical mass modeling, as it focuses on the society welfare rather than on the company's point of view.

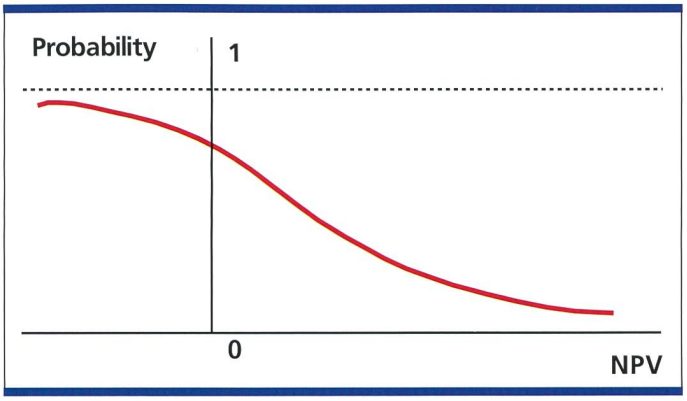

Fig. 11. Risk profile.

Game Theory encodes the interactions between the market players in a competition "game", and determines possible outcomes. Even if Game Theory has a long history, application in "real life" has got increased focus only for a short time. Traditional methods are usually more static, whereas Game Theory captures the complex evolution of the market.

Investment under Uncertainty

Almost all firms recognize that they face major uncertainties about the future, yet most firms' strategic decisions are primarily based on a single projection of future events. Although managers recognize that the failure to include a consideration of uncertainty can lead to costly errors, the difficulty of such planning leads many to ignore the potential costs and hope that serious problems will not arise.
The main steps of a risk management procedure for investment projects are as follows (fig. 10):
– Identification of the risk factors. This refers to the collection and evaluation of the important risk parameters associated with a specific project.
– Forming groups of the risk factors identified in step 1
– Implementation of risk analysis
– Implementation of a risk managing policy according to the results of the analysis in step 3. The risk managing policy defines how the company should react in case a non-favorable event occurs.

Decision making under uncertainty is characterized by the fact that the decision maker is not able to assign a unique value to the outcome of the decision. He must be prepared that the outcome of a decision lies within a range of different values. It is therefore not possible to determine that decision which leads in any case to the best possible result. Such a decision can only be made in an environment which is characterized by certainty. Risk analysis is devoted to developing methods that help analysts to make a decision in an uncertain environment. Risk analysis provides the decision-maker information about the opportunities and dangers of an investment in the form of a probability distribution for the underlying (predefined) decision-making metric (NPV, IRR etc.). In other words, risk analysis is not about finding an optimal decision. Risk analysis tries merely to answer the question about how the risk structure of the output parameters look like, given the risk structure of the input parameters. The properties of the risk structure of the input parameters of an investment problem are in general derived from the analysis of past data related to the parameters or through forecasting techniques.
The result of a risk analysis for an investment project is the risk profile characterizing the investment. The risk profile shows the probability that the project metric assumes a value higher or equal to a certain level, e.g. the probability that the project reaches a value of zero or better. The slope of the risk profile is an indicator of the variance of the outcome. The stiffer the slope the more certain the result. Figure 11 shows a risk profile for an investment project by using the Net Present Value as the valuation metric.
Based on the notation of a risk profile we propose a methodology for addressing the analysis of investment problems. With the proposed methodology we aim at utilizing as well as possible all information accompanying a new investment project. We are especially interested in utilizing all available information concerning all uncertain parameters. Uncer-

tainty is described by using probability distributions which may be discrete or continuous.
The proposed methodology consists of the following steps:
- Modeling
- Develop a numerical model describing the investment project at hand. The values of all parameters are given as well as the probability distributions of the uncertain parameters.
- Identify all different options that need to be examined. Such options may be project delay, project abandonment, shut-down, flexible capacity growth, etc. Be aware that an option may be realized at different time periods, this way defining a new option.
- Define the metrics for measuring project success.
- Monte Carlo simulation: For all options defined in step 1, determine the associated risk profiles.
- At the final step choose among the different risk profiles the one that dominates all the others and best reflects management's risk tolerance.

Figure 12 depicts once more the proposed methodology. The simulation results in risk profiles, one for every potential decision.

Business Plan and Strategic Planning Analysis

The business plan methodology is shown in figure 13. The main goals of business plan analysis is to evaluate the economics of a new project or a new business.
The incremental cash flows analysis and the indexes calculations (i.e. Net Present Value) support the decision-making process for an investment project: comparing the results of the business plans of different (alternative) projects, the strategic decision makers can choose among them in the right way.
Moreover, the risk analysis (from the sensitivity analysis on the cash flows to Monte-Carlo simulations and the real options analysis) can help the planners to take risk into account (i.e. to evaluate a project not only on the basis of its profitability, but also on the basis of the risks related to it).
Finally, the results of the analyses (incremental cash flows) can be used as inputs to strategic planning tools to evaluate the evolution of the FAC (Fully Allocated Costing methodology) costs of the single services. This way the strategic planners can see the effects of the new services/network solutions on the overall company trends of costs and revenues and on the profit and loss accounts of each Business Unit (BU, i.e. aggregation of services).
Through the BU profit and loss accounts it is possible to identify the strategic position of the company (e.g. margin versus market share) and the strength and the weakness of the company for each market segment.
Figure 13 shows the two different processes, Business Plan Analysis on the left side and Strategic Planning process on the right.

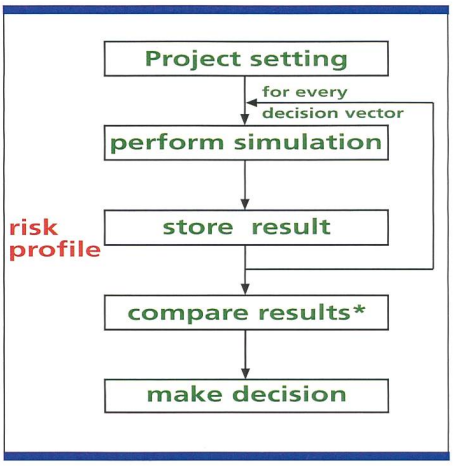

Fig. 12. Proposed methodology.

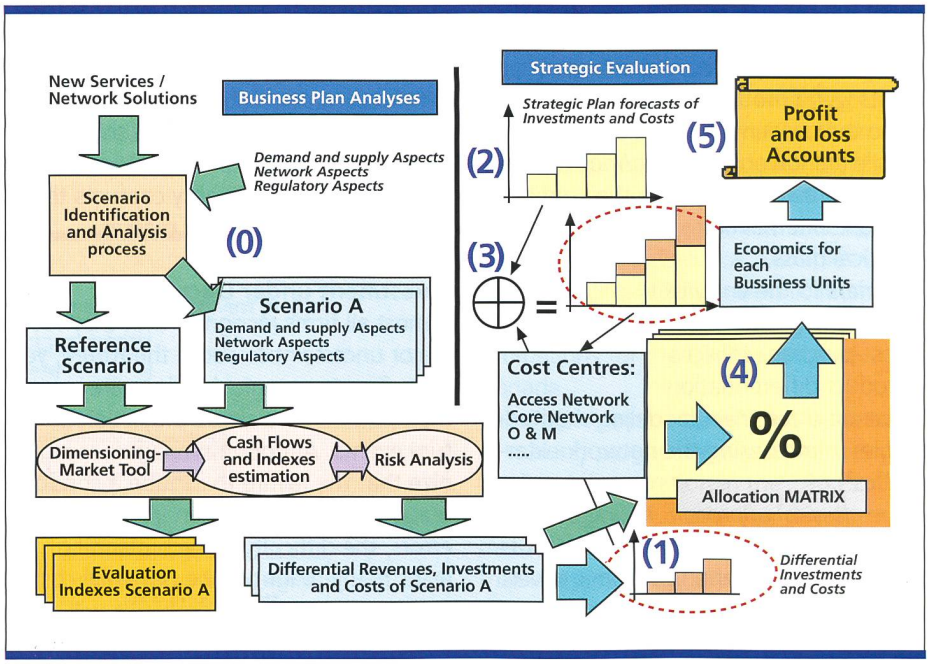

Fig. 13. Business Plan and Strategic Analyses.

Zusammenfassung

Telecommunication Investment Assessment Framework

Der zunehmende Wettbewerb zwingt die Anbieter von Telekommunikationsdienstleistungen zur Minimierung der Kosten. Man ist sich einig, dass sich im Kampf um Marktanteile auf Dauer nur wird behaupten können, wer mit neuen, auf modernster Technologie aufbauenden Diensten aufwarten kann.
Das EURESCOM-Projekt P901 beschäftigt sich mit der Bewertung von Investitionsvorhaben, die dem Aufbau neuer Service-Plattformen wie IP-basierten Multimedia-Fest- oder -Mobilfunknetzen oder der Konvergenz von Festnetz und Mobilfunknetz gelten und auf neue Technologien und neue Interworking-Lösungen setzen. Den Schwerpunkt bilden die Risikoanalyse und auf gemeinsamen Bewertungsmodellen beruhende quantitative Analysen. Unter diesen Modellen finden sich solche zur Kostenerfassung und zur Einschätzung des Marktes, der Wettbewerber und der externen Effekte.

The steps to evaluate the profit and loss accounts of each Business Unit are the following:

- (0), (1) The Business Plan process produces the incremental Revenues, Costs and Investments for the three years of the Strategic Planning;
- (2), (3) The incremental Costs and Investments of the Business Plan can be added to the Costs and Investments (2) of the related Cost Centers, while the incremental revenues can be added to the related BU revenues; this sum is possible only if costs, investments and revenues are calculated on incremental basis;
- (4) Through some allocation matrixes (which implement networks models) the costs are allocated to the services and then to the Business Units;
- (5) The last step is to evaluate the impact of the project on the overall accounts of the company, and on the specific Business Units (BU), through the production of profit and loss accounts for each BU. [3]

Alex Jalalian *is a Computer Scientist and Mathematician from the University of London. He has attended the International Executive Masters Program at London Business School. He has worked continuously within the Telecom & IT industries, with assignments ranging from software & system engineering in switching to product management in transmission. From August 1998 to May 2000, he has been working for Swisscom Corporate Technology as program manager where he was responsible for "Technology Strategy". As Swisscom project leader and Eurescom sub-task leader, Alex has "harvested & woven" this article from the second deliverable of the Eurescom P901 project.*

All other participants contributing to the second deliverable were as follows:
CSELT Italy: Salvatore Majorana, Davide Tacchino
Matav Hungary: Attila Gyürke, István Fekete, Rozália Konkoly
OTE Greece: Dimitris Katsianis, Iordan Iordanidis, Vasilis Orfanos, Dimitris Tsagoulis
Swisscom: Valerie Bauwens, Dominique Chikhani, Ilias Dedopoulos, Lucien Budry
Tele Danmark: Nils Kristian Elnegaard
Telefonica Spain: Antonio Ruiz-Cantera, Héctor Rodríguez-García, Marta Ramírez-Trujillo
Telenor Norway: Leif Aarthun Ims, Markku Lähteenoja, Rich Ling, Borgar Olsen, Dagfinn Myhre, Bjorn Hansen, Ralph Lorentzen

« ETSI supports Bluetooth UnplugFest »

The European Telecommunications Standards Institute (ETSI) hosted the third «Bluetooth UnplugFest» from 7 to 11 August 2000. The event was held in Sophia Antipolis, France, and attracted more than 300 engineers from 60 companies around the world. The Bluetooth UnplugFests allow companies to test the interoperability of their upcoming Bluetooth products.

The Bluetooth wireless technology is a specification for a small form factor, low cost, radio technology that can be integrated into mobile devices. Bluetooth wireless technology eliminates the need for the plethora of cables used for connecting computers, mobile phones, mobile computers and handheld devices. The first Bluetooth products are expected to hit the market by the end of this year.

Francis Truntzer of the Intel Corporation and current chair of the Bluetooth Special Interest Group, comments: "The objective of UnplugFests is to provide Bluetooth developers with an opportunity to conduct interoperability testing between their implementation and other companies' implementations. The market wants interoperability, and Bluetooth UnplugFests are a big step towards it."

Hans Andersson and Thomas Will, responsible for the Bluetooth interoperability programmes within Ericsson and Nokia respectively, point out that, since the last Bluetooth UnplugFest, attendance has increased by 50%, demonstrating the momentum that Bluetooth has generated.

Reinhard Scholl, responsible for the ETSI Bake-off Service, adds: "These testing events speed up the process of bringing products to the market, and their usefulness is consistently ranked very high among the participating engineers. It allows them to 'debug' their implementations and to ensure that all parties interpret the standards the same way."

This event was part of the ETSI Bake-off Service. ETSI has already supported various standards testing events. Last month, for example, the Institute co-hosted the IMTC SuperOP event, which enabled manufacturers of multimedia conferencing and telephony products to test the interoperability of their current and future products.

ETSI
Florence Pontieux
ETSI Press Officer
France
Tel. +33 4 92 94 43 12
Fax +33 4 92 38 49 32
E-Mail: press@etsi.fr
For Bluetooth SIG, Homepage:
www.bluetooth.com/pressroom/contact/contact.asp