

FACILITY MANAGEMENT BASED – INTEGRATED SUBSTANTIATED PORTFOLIO MANAGEMENT OF THE UNIVERSITY OF VIENNA

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Abstract

This study focuses the critical assessment of long-term efficiency and site optimisation of organisations with multiple sites using the example of the University of Vienna to find answers about differences between portfolio site optimisation of one and multiple site organisation, how differences can be managed in focusing the assessment criteria of multiple sites and how organisations with multiple sites have to ensure standardised methods and assessments for optimisation and efficiency increase. Based on scientific literature research for portfolio, management, portfolio management and assessment criteria an empiric investigation, focusing the portfolios of the University of Vienna, where the building information of sites are holistic analysed including costs a status report is created, which can be used as a framework for practice use from other organisations. The results of this study show that holistic portfolio management enables organisations to work in a more structured way in decision making and in valuing the impact of investments and that they get in position to decide effectively to decrease costs and to increase profits.

Keywords: Holistic portfolio management; assessment of real estate; framework portfolio management; investment in sites

INTRODUCTION

Costs of used buildings are simply seen as rents and operating costs. Therefore, uncertainty of user costs exists. User costs are investments to ensure long-term maintenance of the building values and are currently not accounted in a structured way. Hence, there exist no long-term budgets for planning processes which influence the weighting of these impacts. Moreover, the economically success of organisations is strong influenced by costs like rents, energy, cleaning, maintenance and so on. Furthermore, the costs of the entities own use are not harmonised with core needs of rooms and functions of the organisation. The demand oriented values of the organisation are significant tools for holistic evaluation criteria. To ensure the needs of the organisation it is essential of all groups to be embedded, completely. This study, based on up-to-date scientific literature review demonstrates an assessment on own used entities sites and enfolds the following groups and impact-criteria: Economically, legally, structurally engineered, building equipment and appliances functionally, safety related, investment necessity, politically and socially change. The results of this holistic assessment data based approach are the base for strategically simulations of sites. Structural measurements and benchmarking ensure optimised economically sites decisions, comprehensibly. Moreover, it is possible to simulate impacts of arrangements and investments on the quality of sites.

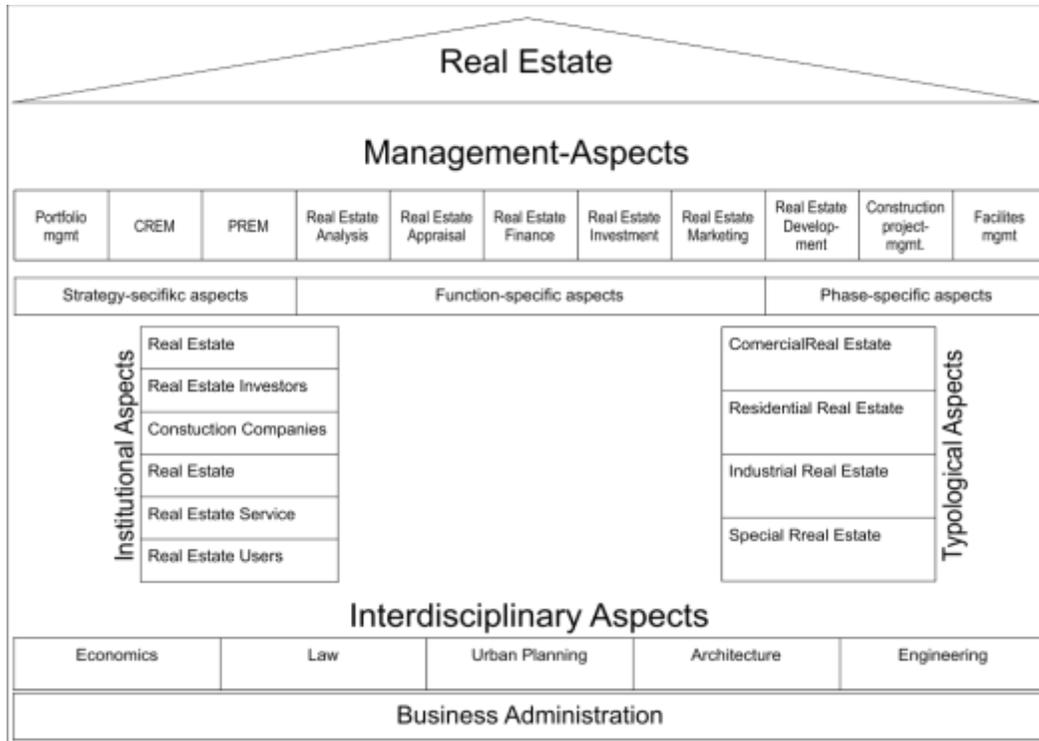
Using the example of the University of Vienna this study aims to develop the base of strategically and comprehensibly site decisions based on economically impact. The results of this study can be used as a framework for holistic portfolio management and is therefore an essential contribution for other organisation in practice.

RESEARCH METHODOLOGY

The illustration# 1 of the house of real estate shows the management aspects, the institutional aspects, the typological aspects and the interdisciplinary aspects of real estate management.

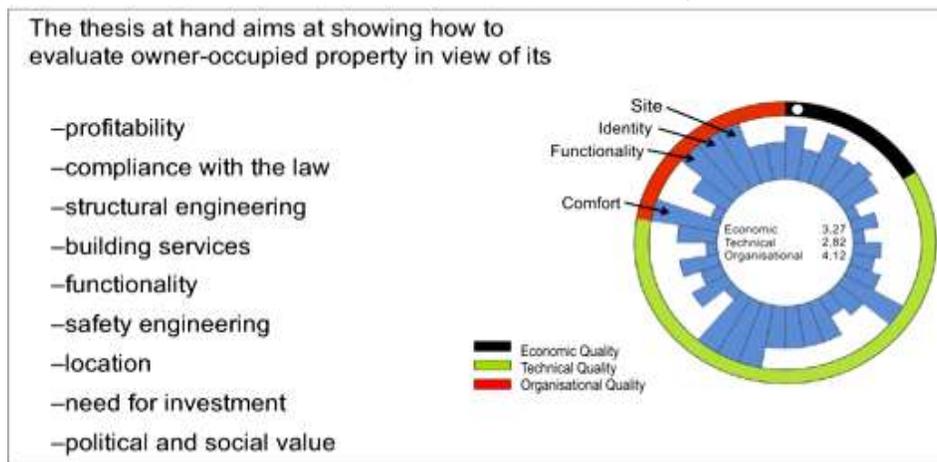
The sites of University of Vienna are assessed according to illustration# 2 with the following factors: profitability, compliance with law, structural engineering, building services, functionality, safety engineering, location, need for investment and political and social values. An ideal building site was created and each site of the University of Vienna was compared to the factors of the objects and building elements, the site and its position, the surface areas, the usage of faculties, objects and site strategies, lease costs, cleaning costs, technical operation costs, energy and supply costs and space efficiency. All criteria are weighted built on thresholds values and at the end all locations are assessed on these weightings so that the expenses for costing purposes to improve organisational criteria, the capital investments requirements and the portfolio ranking can be presented as results.

Illustration 1: House of Real Estate



Source: Schulte & Schäfers (2005, p. 58)

Illustration 2: Evaluation of owner-occupied property – own illustration



Source: Authors' illustration

RESULTS

Today's structural engineering uses plotting programmes, architects are planning with programmes like ArchiCAD and for building equipment and appliances AutoCAD is used. These programmes are isolated applications and the transformation in other programmes is unabstracted and the volumes of data streams can only be handled with data sticks.

Scandinavian countries have advanced significantly advances of modelling building information. The 5D-planning model BIM enables the data- and process management of quantity calculation, logistics, and controlling in a state of the art function (Behling, 2016, p.4). For facility management and investments there exists no administration tool for costs and essential investments and therefore factors for lifting standards are not available for calculation. To address this gap, this study focuses on development of a strategic approach to consider sustainability and enhancement in property portfolio and facility management. The creation of portfolios can be in an active or a passive way. Activity portfolios picture the investor's prospects and its realisation whereas passive portfolios are reactions the market developments (Eller & Dressbach, 1997, p. 18). The house of real estate shows the management aspects, the institutional aspects, the typological aspects and the interdisciplinary aspects of real estate management. The management aspects comprise the portfolio management, CREM, PREM, real estate analysis, real estate appraisal, real estate finance, real estate marketing, real estate development, construction project management and facilities management. These aspects are divided in three categories, the strategic-specific aspects, the function-specific-aspects and the phase-specific aspects. Institutional aspects are focussing real estate, real estate investors, construction companies, real estate services and real estate users. Typological aspects are the commercial real estate, the residential real estate, the industrial and special real estate. Interdisciplinary aspects of real estates are economics, law, urban planning, architecture and engineering. Constructing a new portfolio, it is essential to identify the investor's preferences, objectives and constraints (Wüstefeld, 2007, p. 69). Therefore, it is essential to understand investor's needs; pertained trade-off of risks, return and liquidity. Finally, the portfolio management process has to define the investment approach which achieves the investor's goal and objectives (Mueller & Louargand, 1997, pp. 967 et. seqq.). Available techniques to classify quantitative and strategic qualitative portfolio approaches are shown in the following table:

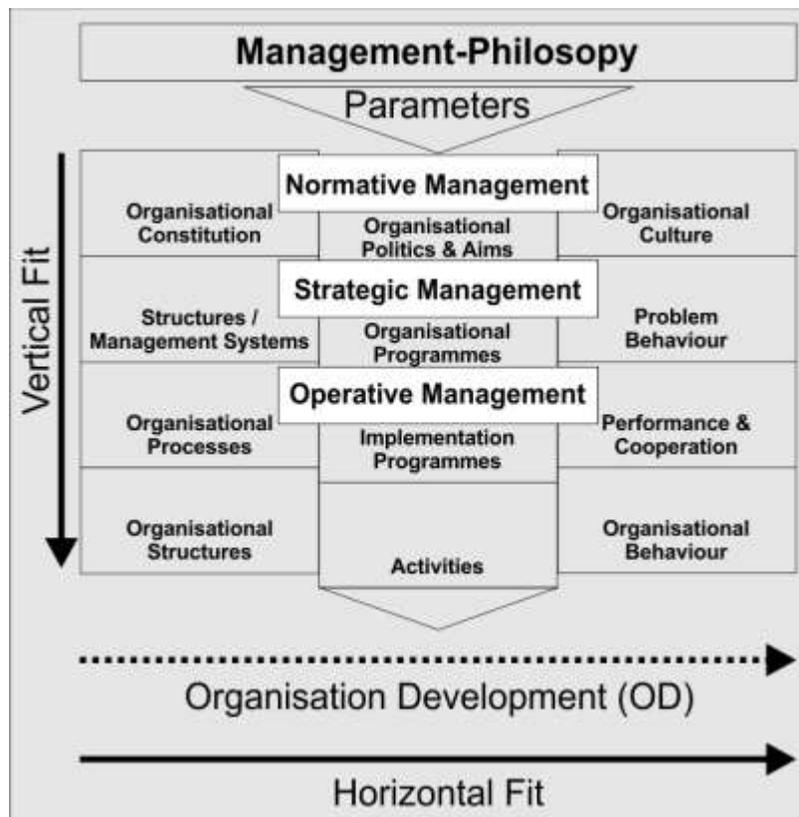
Table 1: Portfolio construction techniques

Quantitative approaches for portfolio approaches	Strategic approaches to portfolio construction
Modern portfolio theory (MPT)	Learning curve effects model
Capital asset pricing model (CAPM)	Profit impact of market strategies (PIMS)
Sharpe model	BCG matrix (Growth-share matrix)
Arbitrage pricing theory	McKinsey Matrix
Downside-risk approaches	
Black-Litterman model	

Source: Schleich (n. d., p.17)

The term management is determined from various disciplines like psychology, sociology, business administration, philosophy, political sciences and therefore different and interdisciplinary approaches were developed (Walenta, 2012, p. 496). Management is a process to affect others, in context of groups and to achieve results in which the aims are aspired by the leader and also by the managed (Walenta, 2012, p. 396). The challenge of the management is based on domination and control and the acceptance of the environments complexity, the change of information technologies, internationalisation and the change in social values. Therefore, it is essential for the management to adapt structures and processes within the organisation and simultaneously to perpetuate organisational outside intensity (Eckardstein, Kasper & Mayrhofer, 1999, pp. 252-253). Based on experience of nature it is concerned that complex systems can get structurally unstable, if efficiency is strongly underlined than the aim is to achieve a well-balanced organisation, between the two poles of efficiency and capacity (Voegel, 2011, p. 3). Moreover, as usual methods and thought patterns are not sufficient; to manage these new challenges new methods are essential forming the management of socio-technique systems (Malik, 2011, p. 32).

Illustration 3: Normative, strategic and operative Management



Source: Voegel (2011, p. 14).

The proposition of holistic thinking in a complex environment is essential in the illustration above of the normative, strategic and operative tasks of management. Based on the philosophy of the management and its parameters of normative, strategic and operative tasks the results are the vertical and horizontal fit of the organisations which is essential, that the organisation's development can be achieved (Voegel, 2011,p. 14). The normative management set up the organisational constitution, the organisational politics and the organisational aims whereas the strategic management is responsible for structures and management systems and for the management programs which built the base for organisational success. The operative managements deal with organisational processes, implemented programs and certain organisational performance and cooperation (Voegel,2011, p. 14).Management and Leadership go cross-cultural and how to lead is defined un-sharply and demonstrated with a tight and a widely style of leadership. The wide leadership-style is based on a personal- and behaviour oriented management, where leadership enfolds all interactional and structural approaches, like management-functions, planning, information-management, controlling and human resources. Tight leadership is based on direct interaction between management and employees, where qualification- and motivation potentials are activated for success (Wunderer & Grunwald, 1980, pp. 52 et. seqq.). Leadership is divided in classical and newer theories. Classical leadership theories are the trait theory, behaviour-oriented leadership and situation leadership theory. New leadership styles are charismatic leadership, transformative leadership and leadership based on emotional intelligence. A comparison between the terms management and leadership are presented in the following table:

Table 2: Comparison of management and leadership

Management	Leadership
<ul style="list-style-type: none"> • Administration • Controlling • Short-time Orientation • Questions of how and when 	<ul style="list-style-type: none"> • Innovation • Inspiration • Long-Time Orientation • Questions of what and why

Source: ARGO-Study (2009, p. 6)

Management in that sense builds a stare framework and enfolds administration, control and short time-orientation. In contrast to management, leadership is based on inspiration and innovation and long term orientation. The leadership style can be determinated by the leader or by the behaviour of the organisation and typical approaches based on empiric research are about efficiency (Staehele, 1999, p. 338). To understand cultures and implicit leadership in theory the GLOBE (Global Leadership and Organizational Behavior Effectiveness) and Hofstede's

cultural dimensions are discussed in short. "Culture is a fuzzy and abstract notion and the first challenge for researcher is to define it." (Yeganeh, Su & Chrysostome, 2004). Hofstede defined culture as the collective programming of the mind which distinguishes the members of one human group from another (Hofstede, 1980, p. 260).

Psychic distance is a specific form of attitudes and the learned and relatively inner stable attendance to react on environment stimuli (foreign culture) in a certain way of foreignness (Kornmeier, 2002, p. 23). Zanger et al. presented a concept of psychic distance which distinguishes between foreign and home characteristics (Zanger et al., 2008, p. 47). Cognitive knowledge structures determinate decisions of managers and organisations. Decisions are based on multiple and individual processes, considering action alternatives, advantages and reactions according to self-perception and expectations (March & Simon, 1958, pp. 84 et seqq.). Thomas argues that social and social-psychological considerations are the base and that people react of real perceived and defined situations with real consequences (Thomas). As managers define relational risks according to multiple facets four main risks are analysed: (Delerue & Simon, 2009, p. 18): 1. Opportunistic behaviour risk 2. Encroachment risk 3. Non-Learning risk 4. Defection risk.

Multiple interpretation patterns of protagonists' demand for higher competencies and allocation of sense. The personal identity of protagonists affects the results and cultural and institutional differences make it difficult to decide in the right way (Thomas, 2006, pp. 362-380). Therefore, Fritz and Möllenberg demand for clear definitions of intercultural behaviour competences and underline that these competences are an evitable requirement for appropriate levels of communication and cooperation in intercultural relationships. Intercultural competence is based on the readiness to act with other cultural systems and relies on the ability to recognise, evaluate, sense and behaviour in a way of respect to own and to others (Guillén, 2000, p. 118). Organisations are embedded in an environment which forms expectations to the organisation and Meyer & Rowan argue "...that the formal structures of many organizations in postindustrial society [...] dramatically reflects the myths of their institutional environments instead of the demands of their work activities." (Meyer & Rowan, 1977, p. 341). Organisations are systems of individuals which act to achieve explicit formulated aims (Schimak, 2001, pp. 200 et seqq.), or as defined by Petzold: Organisations are systems of persons, groups or social entities which are based on long-term work-sharing framework cooperate, to achieve systematically aims originating from system-environmental-relations of the organisation, to guarantee organisational survive (Petzold, 1998, p. 399). Maturana and Varela argued that autopoietic systems are living systems as cognitive systems (Maturana & Varela, 1979). Cognitive sciences are focussing to explain which structures and process determinate actions

and decisions (Walsh, 1995, p. 285). As cognitive structures of managers are restricted their decisions are not strategies of rationality (Lewis, 1998, pp. 16-17), therefore system reproduction is based on reflexive regulation of cognition, control, envision and retention (Giddens, 1995, p. 256). The main factors in negotiations and decision processes are based on cognition (O'Grady & Lane, 1996, p. 318) and therefore there is a demand of new instruments to strengthen cognition in a more qualitative way for higher power of forecasts (Stöttinger & Schlegelmilch, 1998, p. 368). "The apparatus of rationality, traditionally presumed to be neocortical, does not seem to work without that biological regulation, traditionally presumed to be sub-cortical." (Damasio, 1994, p. 128) Therefore cognition is hard wired via emotions and feelings are capable of impeding cognition and even driving decisions in the face of negative cognition (Damasio, 1994 p. 174). These circumstances correspond to the ideas of explicit and implicit learning (Heath & Nairn, 2005).

Emotions are directly connected with the limbic system of brain and according to Goleman each emotion builds the base of specific readiness for action which proves of values in this case of evolution (Goleman, 2011, p. 20). In brain there are two amygdalae which memorise emotional memories and experiences. The limbic system is an open system which relates to external factors (Goleman, 2011, p. 20). Intelligence is defined as "the aggregate or global capacity of the individual to act purposefully, to think rationally, and deal effectively with his environment." (Schulze, Freund & Roberts, 2006, p. 43). Emotional intelligence is seen as the ability of power to follow instinct feelings of human energy, information, solidarity and influence to feel, to understand and act effectively (Cooper & Sawaf, 1997, p. 13). In contrast to that Goleman argues that emotional intelligence is the ability to recognise the feelings of others and of our own for self-motivation and to manage emotions in relationships (Goleman, 2011, p. 387). Based on Nerdinger et al. leadership is the conscious and goal oriented influence of people (Nerdinger et al., p. 82).

Facility management is a common discussed theme through scientific literature as costs of properties are mostly the biggest factor in economical annual statements besides buildings and machines of organisations (Stern, 2001, p. 11). As about two third of organisations do not possess actual data of their properties and buildings it is obvious that facility management is essential (Stern, 2001, p. 11). Facility management represents more than the management of buildings and sites, it enfolds also architecture, production-processes, supply-change-management and workflow-processes (Stern, 2001, pp. 11-12). Facility management is a holistic management concept based on three pillars (Stern, 2001, p. 14): Holistic; Transparency and; Life-time-cycled.

Based on these pillars facility management can be defined as a strategic concept of managing, administering and organisation of all objective resources within an organisation (Stern, 2001, p. 15). Therefore, facility management is related with the coordination of psychic working fields (place) with working force (people) and processes. It should be underlined that facility management is only a management effort, and cleaning, catering or site administration are only services, which must be fulfilled according to the management advice (Stern, 2001, p. 15). Quantified potential of using facility management are rarely published and differ between 10 to 30 percent also the allocation bases are not namely published (Stern, 2001, p. 16). Possible approaches for optimisation starting with planning and end with demolition of buildings. Overall costs within a building's life-time circle are spreaded within 5 to 15 percent during the construction phase, the rest 85 to 95 percent are the costs of usage, therefore the main aim of facility management can be argued in cost optimisation of all objective resources within an organisation (Stern, 2001, pp. 16-17). Based on the holistic approach of facility management there can be a differentiation of usage potentials in quantified and not quantified factors. Quantified usage factors are related with areas, time- and cost optimisation.

Portfolio management beyond the principles of quantitative theories suggests a transfer from strategic management to the determination of optimum property portfolio allocation (Bone-Winkel, 1994; Wellner, 2003). Actually, real estate optimisations are managed non-systematic, ineffective and without control of convergence and unsure boundary conditions of high relevance are not considered (Jakob, 2012, p. VII). Portfolio management involves a multitude of various assets (Bruns & Meyer-Bullerdiek, 2008, p. 93). Basically, there is a differentiation between active and passive portfolio management: Active management is based on future orientation whereas passive management shows the reality (Eller & Dressbach, 1997, p. 18). To get market trends the investor can choose between the technical analysis and the fundamental analysis (Bruns & Meyer-Bullerdiek, 2008, pp. 124 et seqq). The fundamental analysis compares the inner value with the market value under consideration of macro-factors like inflation and conjuncture development (Göcken & Schulte, 1999, p. 1). The technical analysis is based on cyclical economic trends (Eller & Dressbach, 1997, pp. 20 et seqq). There exists a broad range of possibilities to get psychological samples, like financial charting trends, moving average, Elliot Wave and Candle-Sticks. The portfolio strategic matrix analysis suggests alternatives for each business, and develops priorities for resource allocation (Lin & Hsieh, 2008, p. 385). The feasibility analysis of strategic plans should the organisation aware of attainment of other goal.

The methodology of a project clarifies related roles and responsibilities and it emphasises empowerment of the project team with a strong leader (Dao, 2011, p. 52). A project

organisation requires professional skills from different functional departments and involves commercial professionals and personnel with technical background. Single projects composed to portfolios and programs to facilitate their management may be embedded in a multi project environment (Dao, 2011, p. 5). According to Patanakul and Milosevic multi-projects are defined as: “organizational-level environment in which multiple projects are managed currently.” (Patanakul & Milosevic, 2009, p. 217).

The decision of sites is fundamental, irreversible and complex; (Fischer, 1997, p. 28) therefore the decision for optimal sites is one of the eldest problems discussed in scientific-economic and geographically literature (Pellenbarg et al., 2002, p. 114). Actually, in dynamic development of competition and economic liberalisation, the decision for an optimised site can be a competitive advantage (Droege, 2004, p. 15). In case of direct investments in foreign countries the complexity is rising and the assessment criteria and number of objects increase considerably as sites relate to networks of contacts and relationships with other organisations, institutions and markets (Voppel, 1999, p. 15). Moreover, site decisions are of high risks and are long-time and high investments (Fischer, 1997, p. 28). The results of empiric studies show that organisations have a lack of planning strategies in practice (Büschgen, 1970, p. 5).

Regional science of site decision follows the principle of profit maximisation (Wagner, 1998, p. 64) and is splitted in the following theories (Schätzl, 2003, p. 28):

- Theories of sites
 - Theory of organisational site decision
 - Structure of sites theories
- Regional mobility theories
- Regional growth and development theories

The base problem of theoretic site decision can be formulated as: How can a site are found which is optimal for the organisation, considering the multiple dimensions of aims, coexistence, qualitative and quantitative factors, and the costs of data collection and also considering uncertainty of information? (Autschbach, 1997, p. 133). In contrast to traditional definition of sites which is based on property, where buildings are erected, the newer sight of view is more focused as the living room of organisation (Spitschka, 1976, p. 10). Site factors, site requirements and the quality of sites in organisational sight of view are economically and relevant factors for producing effort (Haug & von Wangenheim, 1995, p. 73). Therefore, Godau underlines that the connection and impact between site factors and organisational aims should be focused (Godau, 2001, p. 92). Site factors are directly connected with the aims of organisations, whereas site conditions are unvalued realities of sites (Godau, 2001, p. 37).

Differences between potential sites alternatives should be measurable (Lüder, 1990, p. 37) and therefore sites of the same kind cannot be seen as site factors (Hansmann, 1974, p. 17). Based on organisational requirements and diverse aims site conditions are based on specific factors (Godau, 2001, p. 113). Site decisions are one of the base and non-reversible decisions for organisations (Fischer, 1997, p. 28). Site decision solution comprises of four main factors: Site determination, site effect, site development and site design (Autschbach, 1997, pp. 126-133).

Generally, site definitions relate to the living environment of the organisation and Liebmann argues that a site is a geographically place with existing characteristics where the organisation produces services (Liebmann, 1971, p. 13). Site quality is based on site terms and site requirements of the organisation and therefore site factors are confined advantages for activities, if they are on a definite place where the activities can be fulfilled (Haug & von Wangenheim, 1995, p. 73). Assessment criteria of Sites are ecological-, economical- and socio-cultural and functional qualities, the technical quality, the process quality and also the location profile. The empiric part of this study analyses buildings of the University of Vienna. The organisation of the University of Vienna is based on three main boards: the University board, the rectorate and the senate. The rectorate manages 15 faculties and 3 Centres, 35 study programmes, 4 administrative departments, 8 University offices and special bodies. The University of Vienna are spread over more than 75 locations in Vienna. To get reliable results the following factors of the buildings located in Vienna, Türkenschanzstraße, Universitätsstraße and Schottenbastei are analysed:

- Budgets
- Building Information
- Cost details
- Investments
- Status Reports.

CONCLUSIONS

The results of these work show, that a holistic view of sites, their qualities, costs and their usage enables organisations to work in a more structured way in decision making and in valuing the impact of investments. Internationalisation, globalisation and intercultural influences demand organisations to adapt more environmental and user friendly buildings which is directly connected with high investments and operational costs. Based on the results and the framework build in this study they are in position to decide in a more effectively way which helps to decrease cost and to increase profits.

THE WAY FORWARD

This work represents a solid framework of a holistic approach which enables organisations to work out portfolio investments in a more structured way. Further approach should consider more detailed calculation in depth and then, based on this framework a software-program can be written which enables to calculate every portfolio in a short and digitized way. Based on this program organisations are enabled to reduce human resources and administration costs and to increase their profits faster and in a more effective way.

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