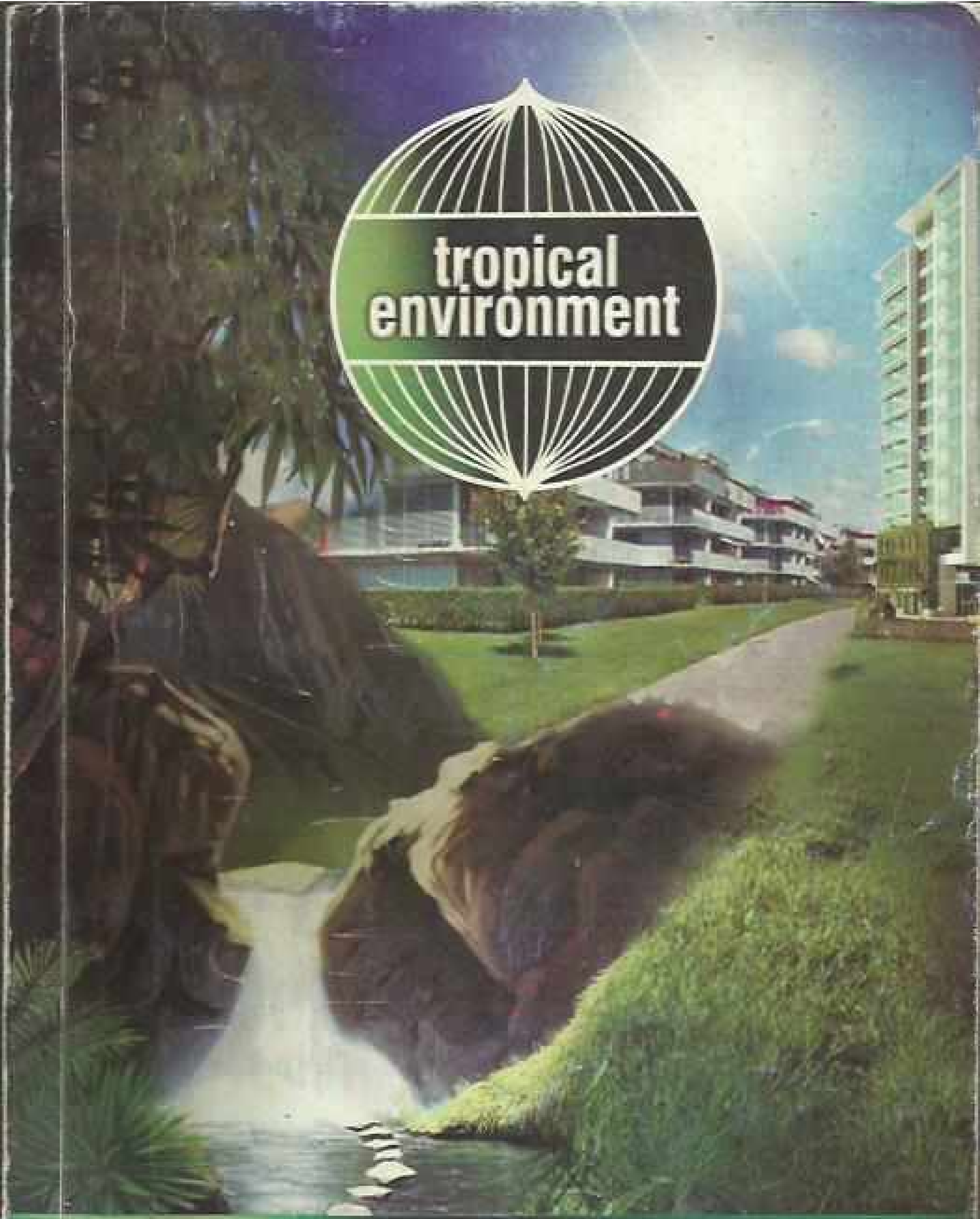
# tropical environment



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# Tropical Environment

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# ANKING OF SPECULATIVE PROPERTY DEVELOPMENT OPTIONS USING CONSTRAINED WEIGHTED FACTOR SCORING MODEL

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*stract*

*estors in the property development business require reliable early stage guide in order to make best use of their scarce resources. One of the factors that influence the accuracy, reliability long term sustainability of such a guide is the type of model applied in evaluating factors ely to influence the selection of the investment. This study, therefore, aims at investigating the ative reliability of scoring models against traditional financial models in project selection and oritization. The method of study was by critical exposition of existing related literature and luative study. The finding of the study showed the ability of constrained weighted scoring del in obtaining weighted measures for revealing the strengths and weaknesses of proposed elopment options in meeting predetermined project selection criteria. The study concluded that ring models bridges the gap created by financial models especially with respect to their bility to cope with non-financial considerations and multi-projects with multi decision criteria. study recommended that project selection must be on criteria that best support achievement of anizational goals.*

**eywords: *Speculative Property, Weighted Factor, Scoring Model***

## troduction

formation on several business investment decisions abound in literature, some with credible results while others have resulted in fatalities that do send investing dividuals and organisations to premature insolvency. Proper choice of investment ojects is fundamental to long-term survival of firms. Varieties of models for entifying, justifying and prioritising projects have been developed and applied in operty management scenarios to suit a multiplicity of circumstances in which ospective clients seek such guide.

estell (2002) identified seven distinct varieties of such models to include the ranking, cision theory, portfolio optimization, stimulation cognitive modelling, cluster analysis d financial analysis. The ranking models simply assist in selecting the best of a series proposed development options but does not provide any useful guide on the financial nefits associated with execution of a particular project (Christenson and Walker, 2004;

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Kenny, 2003; and Kerzner, 2003). The decision theory model provides a sequence for prioritising projects that often require series of decisions before selection of a project. In application, the expected outcome of each proposed project is analysed using a decision-tree algorithm that promptly portrays series of decisions associated with the choice. The result of such analysis presents essentially the highest and the lowest potential values of each project thus compelling the investment analyst to consider only the highest potential value for further comparative analysis.

Portfolio optimization model reviews resource limitations, budget constraints, technical and work content; and prioritizes set of projects in which it simultaneously derives the beneficial outcome from the interaction of each project in the set with all the other projects in the set (Knutson, 1996). It further requires use of linear programming technique to determine the benefits of each project set, including performance of sensitivity analysis to ratify the result that could be referred to as valid. The simulation model determines the outcome of the alternative development proposals which possess different pay-offs within specified range of possibilities that are often determined after performing a specified number of Monte-Carlo simulations. The investment proposal with the greatest benefit is then identified and selected for funding. Thus, the main objective of this study is to highlight the relative reliability of scoring models against traditional models in project selection and prioritization.

**Theoretical Framework**

To succeed in project execution, investing organizations must assess its strengths and weaknesses, in order to align projects with the organization. The next step after project alignment is systematic identification of potential projects. The potential projects emanate from different sources, including response to a market demand, customer request, business need, technological advancement, or in compliance with a particular legal requirement. On identification of potential projects, the next step is the development of the project brief. The projects are summarized in a brief statement of work, narrating the products and services to be provided. A justification of the project is important in order to determine why the project is needed, and if the firm uses financial justification measures, or an estimate of costs and benefits to assess project viability.

Projects have different attributes of costs, benefits and risks which are hardly known or forecast with certainty. Project team need to ensure that overall organizational priorities are understood, agreed, and communicated for ease of prioritisation.

The process of project selection involves evaluating and ranking anticipated returns on a project or a group of projects and choosing to implement some set of projects, such that the objectives of the organization may be achieved (Meredith and Mantel Jr, 2004). The

degree of formality used in selecting projects varies widely. Kloppenborg (2009) posits that project prioritization includes the following considerations:
i. The value each potential project contributes to the organization
ii. Understanding the demands for performing each project
iii. Availability of project resources
iv. Appraisal of projects that best support achievement of organizational goals.
Certain project selection models are crucial to making reasonable choices and arriving at rational investment decisions in spite of inherent uncertainties. Within the limits of their capabilities, models are used to increase profits, select investments for limited capital resources, or improve the competitive position of the organization. Models are also used for ongoing evaluation as well as initial selection, and are considered key to allocation and reallocation of the firm's scarce resources (Meredith and Mantel Jr. 2004). Above all, models must evaluate potential projects by the degree to which they meet a firm's objectives. It is, however, important for project teams to understand the relationship between the project's expected results and organisational goals.

Souder (1973) states that a project selection model must meet the criteria of realism, capability, flexibility, ease of use, high benefit-cost ratio and ease of computerization.

Fundamentally, two types of models exist in theory, namely, non-numeric and numeric models. Both financial and non-financial considerations are vital in project selection. Meredith and Mantel Jr (2004) state that non- numeric models include the following:

i. Sacred Cow model
ii. Operating Necessity model
iii. Competitive Necessity model
iv. Product line extension model
v. Comparative Benefit model

Numeric models include financial and scoring models. Financial models basically compare project costs to expected project benefits. The most common financial models used in project decision-making include: Profit/Profitability models viz:

i. Net Present Value (NPV)

$$NPV_{(project)} = A_0 + \sum_{t=1}^{n} F_t/(1+k)^t$$

where,
$F_t$ = net-cash flow in period $_t$

$K$ = required rate of return
$A_0$ = initial cash investment (because this is an outflow, it will be negative).

ii. Benefit –Cost ratio (BCR): This is also known as the Profitability index model
It is a modified version of the Net Present Value (NPV) method. It is the ratio of the aggregate present values of all future cash-flows to the initial capital investment.

$$\frac{\sum_{t=1}^{n} St/(1+r)^t}{I}$$

iii. Internal Rate of Return (IRR)

$$A_0 + A_1/(1+k) + A_2/(1+k)^2 + \ldots + A_n/(1+k)^n = R_1/(1+k) + R_2/(1+k)^2 + \ldots +$$

$R_n/(1+k)^n$ ; Where, $A_t$ = expected cash outflow in the period t
t = time period
$R_t$ = expected cash inflow for the period t
k = internal rate of return

The value of k is found by trial and error; while $A_0$ assumes a positive value in the above stated problem formulation.

According to Kerzner (2004), for a set of expected cash inflows and cash outflows, the internal rate of return is the discount rate that equates the present values of the two sets of flows.

iv. **Pay Back Period (PBP)**
Pay Back Period is the time required to recover the original investment through income from the project. Assuming the annual income from the project before depreciation but after taxes is uniform, then, the PBP = Original Investment / Annual Income.

The annual income is computed as gross earning less total operating costs excluding depreciation (Choudhury ,2005). In situations where annual income is not uniform, the payback period is the number of years it takes the accumulated income to be equal to the money originally invested. The method assumes that the cash-inflows will persist long enough to payback the investment, and ignores any cash-inflows beyond the payback period (Meredith and Mantel Jr, 2004).

**Table 1: Financial Models for Project Selection**

| | NPV | BCR | IRR | PBP |
|---|---|---|---|---|
| Calculation | PV revenue-PV cost | Cash flow/Project investment | Percentage return on project investment | Project costs/Annual cash flows |
| Neutral Result | NPV = NO | Ratio = 1.0 | IRR = Cost of capital | Payback period =Accepted length |
| Project Screening/Outright Project Selection | NPV > Acceptable amount | Ratio > Acceptable amount | IRR > Acceptable amount | Payback period < acceptable length |
| Project Comparison | Higher NPV better | Higher ratio better | Higher IRR better | Shorter payback period better |

Source: Adapted from Kloppenborg, (2009) Contemporary Project Management, pp.37

There is a complete range of financial models starting from general -purpose spreadsheets to purpose-written software packages (Harris and McCaffer, 2005).

Both financial and non-financial considerations are vital in project selection. Financial odels basically compare project costs to expected project benefits. Kloppenborg (2009) states that financial models are useful in ensuring that selected projects make sense from a cost-and-return perspective while noting that none of the financial models ensure alignment with organisation's strategic goals. Financial analysis though useful is fraught with several limitations including their inability to fit adequately with additional factors aside from financial considerations.

The PBP financial model fail to consider the amount of profit that may be generated after the costs are paid. For example, two projects with a similar payback period could appear to be equal, but the one with higher revenue after the payback period is obviously preferable for consideration of selection. Also, the BCR model is only acceptable if all costs and benefits were calculated in the present value of the chosen currency. The BCR model is similar to the NPV model, except that it is a ratio of benefits to costs instead of the difference between revenue and cost. Both the IRR and BCR models have problems when used for choosing between mutually exclusive projects, because they favour smaller projects that create less total value but with high percentage returns. There is also a difficulty in calculating an IRR if a projects cash-flow pattern is unconventional; in such situations, the NPV is a preferable option. The general deficiency of financial models is that they fail to ensure alignment with organisation's strategic goals (Kloppenborg, 2009). In order for decision makers to cope with additional factors aside from financial considerations, like situations involving multiple projects with several decision criteria, scoring models also referred to as project selection and prioritization matrix are used.

**Scoring Models**

Scoring models were developed in the attempt to overcome some of the disadvantages of profitability models, particularly their focus on single-decision criteria. Scoring models vary in their complexity and information requirements.

**Scoring models are based on the following basic framework**

i. identifying potential criteria
ii. determining mandatory criteria
iii. weighting criteria
iv. evaluating projects based on criteria
v. sensitivity analysis

**Numeric scoring models include:**

i. Unweighted 0-1 Factor model:
ii. Unweighted Factor Scoring model
iii. Weighted Factor Scoring model:

This model is applied in conditions where numeric weights reflecting the relative importance of each individual factor are added. It takes the form:

$$S_i = \sum_{j=1}^{n} s_{ij} w_j$$

where, $S_i$ = the total score of the *i*th project
$s_{ij}$ = the score of the *i*th project on the *j*th criterion, and
$w_j$ = the weight of the *j*th criterion

Organisation's leadership determines the techniques employed in generating the weights, $w_j$.

Several techniques abound in theory for generation of weights, the most effective and commonly adopted is the Delphi technique of Brown and Dalkey. Fundamentally, the Delphi technique develops numeric values that are equivalent to subjective, verbal measures of relative value. Khorramshahgol, Azmi, and Gousty (1988) aver that successive comparisons (the pairwise comparisons) technique is also used to generate weighted numbers.

The probability of technical success for any project is 1.0, if there is no limit on time/and or budget. Meredith and Mantel Jr, (2004) state that the estimate of technical success of a project should be accompanied by time and cost constraints, if it is to be meaningful.

Experts are often used in the development of weights to technological portfolios. Meredith and Mantel Jr, (2004), declare that when numeric weights are generated, it is helpful to scale the weights so that $0 \leq w_j \leq 1$ ; $_{j=1,2,3,\dots,n}$

$$\sum_{j=1}^{n} w_j = 1$$

The weight of each criterion is the percent of the total weight according to that criterion.

The use of weighted scoring model to aid project selection will invariably lead to project improvement. Thus, for a given criterion, the difference between the criterion's score and the highest possible score on that criterion, multiplied by the weight of the criterion, is a measure of the potential improvement in the project score that would result were the project's performance on that criterion sufficiently improved on.

iv. Constrained Weighted Factor Scoring Model: This model takes the form:-

$$S_i = \sum_{j=1}^{n} s_{ij} w_j \prod_{k=1}^{v} c_{ik}$$

where,

$c_{ik}$ = 1, if the ith project satisfies the kth constraint, and 0 if it does not, while other elements of the model are earlier defined in the weighted factor scoring model.

The Constrained Weighted Factor Scoring Model seeks to partially overcome the tendency of including marginal criteria through allowance of additional criteria into the model as constraints instead of weighted-factors. The said constraints are project characteristics that must be present or absent for project acceptance.

Common Project Selection criteria include:

i. Project fit with at least one organizational objective
ii. The number of customers the expected results would serve
iii. Level of company's competitiveness in pricing project results
iv. Possession of needed resources by the company
v. Availability of data for project performance
vi. Stake-holder's agreement on need for project

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v. Availability of data for project performance
vi. Stake-holder's agreement on need for project

vii. The expected return on the project
viii. Sustainability of project results
ix. Extent project promotes or hinders corporate social responsibility
x. Available risks for non-performance of projects

Scoring models have their advantages and disadvantages just like profitability models. Some advantages of scoring models include:
i. Simplicity and ease of comprehension
ii. They allow the use of multiple criteria for evaluation and decision
iii. They depict organizational policy
vi. Flexibility changes in corporate policy and wider environment can easily be accommodated
vii. Recognition of the superiority of some criteria over others
viii. Ease of sensitivity analysis; trade-offs between multiple criteria are readily observable

Also, some of the common disadvantages of scoring models include:
i. Outputs of scoring models are basically relative measures as project scores do not represent the value or utility associated with a project
ii. Elements of scoring models are assumed independent of each other, thus scoring models are linear models
iii. Unweighted scoring models assume that all criteria are of equal importance while this is untrue
iv. The consideration of multiple criteria in scoring models gives rise to little differentials in relative weight of elements and as such, insignificant impact on total project score.

Contemporary research efforts reveal development of alternatives to scoring models as typified in the work of Raz (1997) which depicts an interactive rating process in project selection. Futhermore, Pascale, Carland, and Carland (1997) attempt to compare a weighted scoring model with an unweighted scoring model for evaluation of innovations. Their work further investigated the impact of evaluation models on idea creation, and concludes that weighted scoring models work well with incremental change while unweighted scoring models work better with new idea innovations.

Astebrs (2004) study of over 500 Research and Development projects found out that four project characteristics were excellent predictors of project commercial success, namely:
i. Expected profitability
ii. Technological opportunity
iii. Development risk, and
iv. Appropriability

Studies by Liberatore and Titus (1989) revealed that firms with significant amount of externally funded contract research applied scoring models in their project screening more often than firms with negligible levels of outside funding.

Meredith and Mantel Jr. (2004) posit that scoring models must have the following elements:

i. A set of criteria on which to judge the value of any alternative
ii. A numeric estimate of the relative importance (i.e. the weight) of each criterion in the set; and
iii. Scales by which performance is measured or scored on the basis of their contribution to value of each criterion's alternatives.

Finally, models whether financial or scoring models do not make decisions for people all models, no matter how elaborate or sophisticated; they only represent a fraction of reality. No model can yield an optimal decision except within its own, possibly inadequate framework (Meredith and Mantel Jr. 2004).

**Methodology**

The methodology used involved an evaluative study of a stream of real estate development opportunities in an emerging unpopulated Greenfield environment.

The first step involves generation of a checklist of opportunities that support the mission statement and strategic investment policies of the company. The viable opportunities include development of the following investment options:

1. Housing Estate
2. Business Park
3. Shopping Mall
4. Hotel Accommodation

The second involved articulation of a set of criterion that would be applied in the evaluation of each investment option; in this case the following:

1. Location
2. Capital cost
3. Project execution time
4. Prospective client
5. Compatibility with master plan
6. Marketability
7. Rate of return
8. Proximity to municipal infrastructure

The third step is identification and selection of the preferred development option by subjecting the opportunities to the following assessment criteria:

1. Define the critical, objective and subjective factors
2. Evaluate the critical factor measures
3. Evaluate the subjective factor measures
4. Evaluate the objective factor measures
5. Determine the subjective factor decision weight
6. Determine the objective factor decision weight
7. Make final selection

**Evaluation of Critical factors**

A factor is classified as critical, if its presence or absence precludes the sitting of the project regardless of other conditions that might exist. In the determination of the critical factor measures for each development option, a value of either 1 or 0 is assigned depending on whether the factor is available or not at the proposed site. The critical value measure for each development option is equal to the product of the critical factor indices.

**Table2: Critical Factors for the Systemic Selection of Investment Opportunity in Real Estate Development**

| Investment Opportunities | Compatibility with Master plan | Availability of corporate clients | Capital cost and rate of return | Project execution time | Availability of support infrastructure | Capital cost measure |
|---|---|---|---|---|---|---|
| Housing Estate | 1 | 1 | 1 | 1 | 1 | 1 |
| Shopping Mall | 1 | 1 | 1 | 1 | 1 | 1 |
| Business Park | 1 | 1 | 1 | 1 | 1 | 1 |
| Hotel Accommodation | 1 | 1 | 1 | 1 | 1 | 1 |

***Source:*** *Authors' Field Survey (2011)*

Investment options that failed in the critical assessment criteria would be eliminated from further analysis.

**Evaluation of Objective Factors**

The objective factor index indicates the relative profitability of each potential development by means of a dimensionless index as compared to all other options solely on the basis of objective cost. The formulation and evaluation of the objective factor measures would be based on the following restrictions:

a. The development option with minimum cost of realization should have the maximum objective factor.

b. The relationship of the total objective factor cost for each development option as compared to all the other options must be preserved.

c The sum of the objective factor measures must be equal to one.

In anticipation of scaling problems restrictions, 'a' and 'c' are designed to ensure that the objective factor measure is compatible with the subjective factor measure. Again, the implication of restriction 'b' is that a development option with one half of the objective factor cost of another is assigned twice the objective factor measure of the other development option. The solution of the resulting system of simultaneous equations from the above three restrictions would give an objective factor measure that is a function of the objective cost of each option.

**Table. 3: Objective Factor Costs and Measures for the Systematic Prioritization of Speculative Property Development Options**

| Development Options | Estimated Capital Cost $\times 10^6$ | Availability of support infrastructure $\times 10^6$ | Proximity to municipal facilities $\times 10^6$ | Marketability $\times 10^6$ | Objective factor cost $\times 10^6$ | DCF x 10 [illegible] | DCF x A | Objective factor measure |
|---|---|---|---|---|---|---|---|---|
| Housing Estates | 1300 | 400 | 45 | 8 | 1753 | 0.00057 | 7.906 | 0.126 |
| Shopping Mall | 465 | 175 | 45 | 4.5 | 689.5 | 0.00145 | 3.1096 | 0.321 |
| Business Park | 352 | 116 | 45 | 4.00 | 517 | 0.00193 | 2.332 | 0.428 |
| Hotel Accommodation | 1500 | 214 | 45 | 10.0 | 1769 | 0.000575 | 7.978 | 0.125 |
| A = | | | | | | 0.00451 | | 1.00 |

*Source: Authors' Field Survey (2011)*

## Determination of Subjective Factor Weights

The subjective factor weights seek to measure the relative importance of a subjective factor in the prioritization of the projects. The resulting weights are assigned following a consistent and systematic application of 'preference theory'. The application involves an evaluation of all possible pair-wise comparison between factors resulting in either the first factor is preferred over (more important than) the second in which case, the value '1' is assigned to the first factor and '0' to the second.

Neither factor is preferred, in which case, the value '1' is assigned to both factors. The subjective factor weight for each option is determined by dividing the number of times an option was either preferred or deemed indifferent by the total number of 1s assigned.

**Table4: Preference Table of Determining Subjective Factor Weights for Systematic Ranking of Speculative Development Options**

| Comparison of factors | Development options | | | | |
|---|---|---|---|---|---|
| | Housing Estate | Shopping Mall | Business Park | Hotel Accommodation | Row total |
| Support infrastructure Vs Marketability | 0 | 1 | 1 | 0 | 2 |
| Support infrastructure Vs Proximity to Municipal services | 1 | 1 | 0 | 0 | 2 |
| Support infrastructure Vs Capital cost/ Rate of Return | 1 | 0 | 0 | 1 | 2 |
| Marketability Vs Proximity to Municipal services | 1 | 1 | 0 | 0 | 2 |

***Source:*** *Authors' Field Survey (2011)*

**Table5: Determination of Subjective Factor Measure for Systematic Selection of Speculative Development Options**

| Subjective factor | Development Options | | | | |
|---|---|---|---|---|---|
| | Housing Estate | Shopping Mall | Business Park | Hotel Accommodation | Subjective factor weight |
| Availability of relevant population | 0.6258 | 0.2000 | 0.0667 | 0.3330 | 0.33 |
| Project duration | 0.2777 | 0.2500 | 0.3125 | 0.2941 | 0.11 |
| Capital cost/Rate of return | 0.1333 | 0.2667 | 0.0625 | 0.1250 | 0.44 |
| Competition | 0.1383 | 0.1875 | 0.2000 | 0.2500 | 0.11 |
| Subjective factor measure | 0.2488 | 0.22839 | 0.13638 | 0.15257 | |

***Source:*** *Authors' Field Survey (2011)*

**Heuristic Determination of Profitability Index of Business Opportunities**

The profitability of each development option can be determined heuristically by multiplying the objective factor decision weight by the objective factor measure and adding the result to the product of the subjective measure and the quantity '1', minus the objective factor decision weight, based on a ratio of 80%: 20% in favour of the objective factor measures. The sum obtained is the profitability index of the development option relative to other options. The profitability index could be seen as the weighted average of both the objective factor and subjective factor measures in which the objective factor decision weight is the weighting factor.



**Table 6: Heuristic Determination of the Relative Profitability [illegible] Options**

| Development Option | Objective factor weight | [illegible] |
|---|---|---|
| Housing Estate | 0.12600 | [illegible] |
| Shopping Mall | 0.32100 | [illegible] |
| Business Park | 0.42800 | [illegible] |
| Hotel Accommodation | 0.12500 | [illegible] |

*Source: Authors' Field Survey (2011)*

The development option recording the highest [illegible] recommended, However, it is not unusual to repeat the [illegible] including- definition of new factors, emergence of [illegible] of economic conditions on the values earlier assigned [illegible]

**Results**

1. Critical factors for systemic selection of [illegible] development include: compatibility with master plan, [illegible] capital cost and rate of return, project execution [illegible] infrastructure, and capital cost measure. Each of the [illegible] was allocated '1' of each of the above listed critical factors.
2. None of the investment options failed in the critical [illegible]

On evaluation of objective factors (critical factors for [illegible] speculative property) against development options, [illegible] capital cost, housing accommodation has the highest [illegible] park has the lowest value (352); for availability of [illegible] estates has the highest value (400), while business park [illegible] proximity to municipal facilities, each of the development [illegible] for marketability, hotel accommodation has the highest [illegible] park has the least value (4). The objective factor [illegible] accommodation (1769) and lowest for business park [illegible]

3. The development option with the minimum cost of [illegible] which has the maximum objective factor (0.428).
4. For the subjective factor weights, comparison of factors [illegible] vs Marketability yielded 0 (housing estate), 1 (shopping [illegible]

**Table 6: Heuristic Determination of the Relative Profitability Index of Development Options**

| Development Option | Objective factor weight | Subjective factor weight | Profitability index |
|---|---|---|---|
| Housing Estate | 0.12600 | 0.24880 | 0.15050 |
| Shopping Mall | 0.32100 | 0.22839 | 0 .30240 |
| Business Park | 0.42800 | 0.13638 | 0.36960 |
| Hotel Accommodation | 0.12500 | 0.15257 | 0.13050 |

*Source: Authors' Field Survey (2011)*

The development option recording the highest value of profitability index is recommended. However, it is not unusual to repeat the computation for several reasons including- definition of new factors, emergence of new business opportunities, and effect of economic conditions on the values earlier assigned to some factors.

**Results**

1. Critical factors for systemic selection of investment opportunity in real estate development include: compatibility with master plan, availability of corporate clients, capital cost and rate of return, project execution time, availability of supportive infrastructure, and capital cost measure. Each of the investment opportunities studied was allocated '1' of each of the above listed critical factors.
2. None of the investment options failed in the critical assessment criteria.

On evaluation of objective factors (critical factors for systematic prioritization of speculative property) against development options, results show that for estimated capital cost, housing accommodation has the highest value (1500), while business park has the lowest value (352); for availability of supportive infrastructure, housing estates has the highest value (400), while business park has the least (116); for proximity to municipal facilities, each of the development options had a value of 45; for marketability, hotel accommodation has the highest value (10), while business park has the least value (4). The objective factor cost was highest for hotel accommodation (1769) and lowest for business park (517).

3. The development option with the minimum cost of realization is 'Business Park', which has the maximum objective factor (0.428).
4. For the subjective factor weights, comparison of factors like Supportive Infrastructure vs Marketability yielded 0 (housing estate), 1 (shopping mall), 1 (business park), 0

5.(hotel accommodation) and a row total of 2; Supportive Infrastructure vs Proximity to municipal services yielded 1 (housing estate), 1 (shopping mall), 0 (business park), 0 (hotel accommodation) and a row total of 2; Supportive Infrastructure vs Capital Cost/Rate of Return yielded 1(housing estate), 0 (shopping mall), 0 (business park), 1 (hotel accommodation) and a row total of 2; while Marketability vs Proximity to Municipal Services yielded 1(housing estate), 1 (shopping mall), 0 (business park), 0 (hotel accommodation) and a row total of 2.

6.In determining the subjective factor measure for the systematic selection of speculative development options; availability of relevant population yielded 0.6258 (housing estate), 0.2000 (shopping mall), 0.0667 (business park), 0.3330 (hotel accommodation) and a subjective factor weight of 0.33; project duration yielded 0.2777 (housing estate), 0.2500 (shopping mall), 0.3125 (business park), 0.2941 (hotel accommodation) and a subjective factor weight of 0.11; Capital cost/rate of return yielded 0.1333 (housing estate), 0.2667 (shopping mall), 0.0625 (business park), 0.1250 (hotel accommodation) and a subjective factor weight of 0.44;Competition yielded 0.1383(housing estate), 0.1875 (shopping mall), 0.2000 (business park), 0.2500 (hotel accommodation) and a subjective factor weight of 0.11; The subjective factor measures were 0.2488 (housing estate), 0.22839 (shopping mall), 0.13638 (business park), and 0.15257 for hotel accommodation. Housing estate yielded the highest subjective factor measure, while Business park yielded the least.

7.Heuristic determination of the relative profitability index of development options yielded 0.15050 for Housing estate, 0.30240 (shopping mall), 0.36960 (Business Park)' and 0.13050 for Hotel accommodation.

8.The development option yielding the highest profitability index value (Hotel accommodation) is recommended.

**Discussion**

Alignment of project requirements with the organization goals is a critical consideration and a key success factor in project evaluation. This is because a number of projects do fail at the implementation stages because the project requirements are fundamentally at variance with organizational goals and ideals. A further consideration is the modes of project identification as quite a number of projects fail prematurely because they were not subjected to a systematic identification process that evaluates the critical identification parameters like response to market demand, customer request, business need, technological advancement, or compliance to legal requirements. Another source of project failure is that some projects lack proper brief-a narration of the products and services to be provided. Some projects also fail because of lack of a well articulated project justification statement. Inability to justify project investibility by way of financial measures or other criteria like costs and benefits can also mar selection of a project for implementation. Although project attributes of costs, benefits and risks are hardly known or forecast with certainty; it is teams' responsibility to ensure that the overall organizational priorities are understood, agreed on, and communicated for ease of project prioritization.

The process of project selection follows closely after the prioritization is completed. Project selection involves evaluating and ranking anticipated returns on a project or a group of projects and choosing to implement some set of projects that meets the objectives of the organization. In spite of inherent uncertainties associated with project investment appraisal, certain models aid in the rational decision-making process. Models though fraught with some apparent limitations are used to increase profits, select investments for limited capital resources, or improve the competitive position of the organization. Scoring models as used in this study are applied in the evaluation of ongoing projects as well as in the initial selection of projects. Scoring models can be used to evaluate potential projects by the degree to which they meet a firm's objectives e.g. Location, Capital cost, Project execution time, Prospective client, Compatibility with master-plan, Marketability, Rate of return, and Proximity to municipal infrastructure

**Recommendations and Conclusion**

Proposed development project options should align with organizational objectives. Availability of data is critical to the success of projects.

The extent to which selected projects promote or hinder corporate social responsibility should be assessed. The requirements for project performance are to be determined before selection. The value which potential projects contribute to organization are to be assessed. Selection of projects should be on those criteria that best support the achievement of organizational goals.

In spite of inherent uncertainties associated with project investment appraisal, certain models aid in rational decision-making process. Traditional ranking models simply assist in selecting the best of a series of proposed development options but do not provide any useful guide on the financial benefits associated with the execution of a particular project. Scoring models unlike other traditional project evaluation models are applied on ongoing projects as well as in the initial selection of projects. Scoring models have specific potentials for judging the value of alternative projects from a set of criteria; giving a numeric estimate of the relative importance; and provision of scales by which performance is measured or scored on the basis of their contribution to the value of each criterion's alternatives. Both financial and non-financial considerations are vital in project selection. Financial models compare project costs to expected project benefits while further ensuring that selected projects make sense from a cost-and-return perspective. Financial analysis though useful is fraught with limitations of inability to cope with non financial criteria. Scoring models was developed to assist decision makers overcome the constraints of financial models especially in situations involving multiple projects with several criteria for project selection. Models do not make decisions for people and all models no matter how elaborate or sophisticated only represent a fraction of reality.

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