**MANAGEMENT SCIENCE AND ENGINEERING**
Vol. **4**, No. **3**, **2010**, pp. 10-23
**www.cscanada.org**

**ISSN** 1913-0341 [Print]
**ISSN** 1913-035X [Online]
**www.cscanada.net**

# Success Criteria Framework for Real Estate Project

**NIU Jing-min**[1]

**Thomas G.Lechler**[2]

**JIANG Jun-long**[3]

**Abstract:** Project success is a controversial topic, although many researchers have talked about this, there is no census until now. Real estate project has many stakeholders participate in. For a project, it is impossible for project manager to satisfy all stakeholders' needs. This paper presents a new success measurement framework using a Chinese real estate project, which identifies different success criteria for different key stakeholders throughout the phases of the project life-cycle. This framework can be used as a basis to evaluate project status and to forecast the results in the future at every stage. It could be help key stakeholders and project managers to ensure a project's success. These matrices are tested by two case studies, from government agency, developer, bank, and customer view to estimate project success.
**Key words:** stakeholders; life-cycle; real estate project success

## INTRODUCTION

Countless papers have been written about project success. The research content could be classified to three directions: Some focuses on the factors influencing project success; another examines the criteria required for success; the rest study connects of success factors and success criteria. This paper mainly analyzes the project success criteria. Generally speaking, the industry-accepted classical success metrics for construction project have been cost, schedule, and quality/performance (Kerzner, 2003). Then many people found that these criteria are too limited for measuring project broadly. For these triple criteria assumption precondition is project has the same efficiency. In the reality, some project does realize three triple measurements but it is still failed in the end. Some project is over budget and schedule, but it brings customers value in the long run. They mention their opinions about project success criteria from different perspectives, such as from the project short term and long term; from the macro view or micro view to get the project success criteria; from different participates' view to get the success criteria. Many authors agree that there are many stakeholders taking part in the project, and their success criteria are different. Some researchers discuss different stakeholders' criteria for whole project life-cycle. Some researchers separate

[1] PhD candidate of school of management engineering, Central University of Finance and Economics, 100081 Beijing, China. Major: investment, direction: project management.
[2] Associate Professor, Howe school of technology management, Stevens institute of technology, NJ,USA,07030,201.216.8174. Email: tlechler@stevens.edu.
[3] PhD candidate of school of management engineering, Central University of Finance and Economics, 100081 Beijing. China. Major: investment, direction: project management.
*Received 30 April 2010; accepted 21 July 2010

project to many different stages. They confer every stage have different success criteria. However, they do not get the exact project stakeholder project success criteria. Actually, not all the stakeholders would take part in all the phases of project, so there is a problem for us to address. Real estate projects are cooperative tasks. Construction projects have many different, and sometimes discrepant, interests to be considered (Stefan & Anne, 2005). When measuring project success, one must consider the objectives of all stakeholders throughout the project life-cycle and at all levels in the management hierarchy (Anton, 1988). However, there is no standard method about how to measure key stakeholders' satisfaction during the project life-cycle.

This paper attempts to provide a project success measurement framework: to address the specific complexities of real estate development project. In particular the framework integrates different stakeholder perspectives and the life-cycle of a project. The framework can easily be used as a basis to evaluate the project status and to forecast the results at every stage. It should help key stakeholders and project managers to measure and predict of a project's success in an early stage. First, a project success literature review would be provided, followed by an introduction to stakeholder theory and project life-cycle, using the Mendelow's power/interest matrix (Mendelow, 1981) to identify the key stakeholders. Finally, success criteria are offered for each key stakeholder. Two cases are presented which demonstrate the application to support the framework.

## PROJECT SUCCESS

Many papers talk about project success should be judged from cost, schedule and quality. Some of these are traditional project management view. And many researchers agree that project success has more broad sense than project management success and product success. Tuman (Battena et al., 2008) declaimes that the days when we could define success in terms of cost, schedule and technical objectives are gone. People should address a much wider range of needs, concerns and issues which are presented to us by a diverse mix of project stakeholders. The limitation of traditional project success objectives could be organized as the following:

First, for triple measurements are still widely used because they are easy for use. However, it is put project management into a narrow view. There are many evidences prove that even some project meet budget, schedule, scope these objects, and in the end the projects still couldn't fulfill customers' need. Meanwhile, some projects over budget and schedule, but in the long run they bring the value for its stakeholders. Morris and Hough (Tuman, 1993) cite the Thames Barrier project which took twice as long to build and cost four times the original budget, but provide the profit for most contractors.

Second, traditional project success defined as project achieve scope, cost and schedule three objectives as a tradeoff. But in reality, if one objective failed, in order to get the other project, even project manager get more time, the project can't be within budget either. Traditional project success is based on same project performance efficiency. If the efficiency is changing, the result would be change too. In this case, people can complete the project with lower cost.

Third, triple measurements haven't consider about stakeholders' needs. Although the scope could be defined as what a project should accomplish, when talking about different stakeholders' perspective, triple criteria can't reflect this. Only when project realize stakeholder value and meet triple criteria, traditional project success define could indirectly connect with stakeholder needs.

In 2003, UK's Engineering and physical Science Research Council (EPSRC) launch a research network-Rethinking Project management. In this research council, they identify five directions for interested in developing new research in project management. One of them is transfer from product creation as the prime focus to value creation as the prime focus. Winter (Mark et al., 2006) points out that now many organizations concern is increasing the challenge of linking business strategy to projects, maximizing revenue generation, and managing the delivery of benefits in relation to different stakeholder groups. And the notion of 'value' has multiple meanings linked to different organizational and individual purpose. Value creation continues long after the project managers have moved on. Sauer claims project manager's ultimate

aim is to deliver project value. By interview, he found that project manager is accountable to make sure project is aligned with business objective. In the new mindset, one principle is deep personal identification with project goals. That means belief value–oriented project goals are appropriate with consequential enhanced level of personal ownership and commitment. Every stakeholder take part in project aim is to create their value by project. So project should increase value for stakeholders. We can broad project success definition, from triple tangle to a more extend way. Measure the project should be considering short run, intermediate, long run. The meaning of value is often extended over long time periods. Project success could be defined as project value realize. And project value could be measured by different stakeholder value during project life-cycle.

Anton de Wit (De, 1988) mentions that one must consider the objectives of all stakeholders throughout the project life cycle and at all levels in the management hierarchy. He gives a commercial oil-field development project as an example. Its stakeholders include contractors, government, suppliers, banks, community groups, regulatory agencies, media, and trade associations. Hughes (Morris & Hough, 1986) talks about the construction project success, the objective success metrics: cost, schedule, performance, and safety.

Interactions between time, different perspectives and real estate project success have been reached. In general, this research shows:

Project success has related with time.
Project success for different perspectives have different definitions.

## ACCORDING TO TIME TO MEASURE PROJECT SUCCESS

Aaron J.Shenhar (Shenhar et al., 1997) gives the project success measurement framework. It includes four distinct dimensions: project efficiency, impact on the customer, direct and business success, and preparing for the future. These criteria are organized by time. Lopes and Flavell (Lopes & Flavell, 1998) gives a framework to appraisal non-financial projects. At the preliminary, they should do the strategic analysis. As the early stage of project life-cycle, technical analysis, social analysis and environmental analysis should be done. Before the initial commitment, political analysis should be done. Mohamed (Lim & Zain, 1999) sets a framework to measure project success. In the Micro view of project success, project success criteria are time, cost, quality, performance, safety. In the macro view of project success, project success criteria are completion time, satisfaction of utility and operation. Micro view is for the project construction stage. Macro view is for whole project life-cycle. Project life-cycle includes conceptual, planning, design, tender, construction, operation. Roger Atkinson (Roger, 1999) defines new framework to consider project success criteria. It is at the delivery stage, project should be consider make sure the process doing the right thing. The post delivery stage is to make sure the system is getting right. Chan, Scott, and Lam (Albert et al., 2002) give an assessment framework for project success of design/build project. Pre-construction phases, object measures are time and cost; subjective measures are quality, technical performance, satisfaction of key project participants. At the construction phase, objective measures are time, cost, health and safety. Subjective measures are quality, technical performance, productivity, satisfaction of key project participants, and conflict management. At the post-construction phase, objective measure is profitability. Subjective measures are satisfaction of key project participants, end-users and outsiders. And these people's success criteria are completion, functionality, aesthetics, and professional image, educational, social and professional aspects. Final one is environmental sustainability. Jugdev and Muller (KamM & Ralf, 2005) do the project success review, and talk about future project success research trend. They divide construction project life cycle to feasibility, planning and design, production, turnover and start up. Khang and Moe (Do & Tun, 2008) research about success criteria and factors for international development project. They identify project life-cycle as five stages: conceptualizing, planning, implementing and closing/completing, overall project success. They give their division of success criteria in different project life-cycle. In the conceptualizing stage, criteria include make clear target group needs, agency capable, raise key stakeholder interests. In the planning stage, get key stakeholders support, prepare for the resource, team get ready for project start. In the implementing stage, as the plan do the project, inform key

stakeholders about the process. In the closing/completing stage, check all the work done, report the results to key stakeholders. Overall project success is good for beneficiaries, good reputation, and good chance as a success, sustainable.

Project Life-Cycle refers to a logical sequence of activities to accomplish the project's goals or objectives. At EPSC topic of rethinking project management, one direction is changing project lifecycle model to theories of the complexity of projects and PM. They think life-cycle model is too simple, and doubt about whether life-cycle model could cover the real "terrain" of project. Actually, life-cycle model is a good method to reflect project progress according to time. For real estate project, usage stage could be extend a long time. According to real estate project feature, this paper divides the cycle into five stages.

(1) Initiation. This is the first stage from the proposal concept initiation ideation, through the initial investigation and initial assessment, and the preliminary investigation; evaluation research is generated, the scope of the project is defined, and an objective manager is appointed. He in turn selects the team members based on their skills and experience. The goal of this phase is to evaluate the existing proposal in terms of financial, operational and technical viability as well as obey the company's strategy.

(2) Planning. This stage involves detailed investigation, definition business details, evaluation authorization. Design, development, creation and building solutions could be chosen are all in this stage. The supporting system, manuals, business processes and training for the solution must also be developed during this phase. The optimum solution to address the business need must be identified and defined. All areas of these solutions must be analyzed and assessed to determine concerns and risks. The second phase should include a detailed identification and assignment of each task through the end of the project. It should also include a risk analysis. The governance process is defined, stakeholders identified and reporting frequency and channels are agreed upon. The most common tools or methodologies used in the planning stage are Business Plan and Milestones Reviews. A Feasibility study has been done. The building blueprint is designed at this stage, a supervisor institute has already set up, the materials supplier and construction contractor are fixed, and the real estate company has government permission to build this project.

(3) Execution. The most important issue in this phase is to ensure project activities are properly executed and controlled. During the execution phase, the planned solution is implemented to solve the problem specified in the project's requirements. As the execution phase progresses, groups across the organization become more deeply involved in planning for the final examination. The most common tools or methodologies used in the execution phase are an update of Risk Analysis and Score Cards, in addition to Business Plan and Milestones Reviews. For real estate projects, there are many uncertainties during this period. At this stage, the building should be completed on time, as the schedule. Most likely the real estate developer has subcontracted the project to the contractor for a fixed price. The developer would not be adversely affected by the cost efficiency of the subcontractor, but could be affected if the project under-runs or over-runs its target duration.

(4)Sale. In this last stage, the project manager must ensure that the project is completed properly. The closure phase is characterized by a written formal project review report, which containing a formal acceptance of the final product by the client. For a real estate project, real estate developer, use Weighted Critical Measurements (matching the initial requirements specified by the client with the final delivered product), rewarding the team, a list of lessons learned, releasing project resources, and a formal project closure.

Munns and Bjeirmi (Munns & Bjerirmi, 1996) define at different notification to higher management. No special tool or methodology is needed during the closure phase. The purpose is to validate the acceptance and capabilities of the solution.

(5) Usage. This is customers using the project product. The project should be assessed to determine if the proposed benefits were delivered and what the impact of the project was on the business. Lessons should be documented for future reference.

In different stage of project life-cycle, different stakeholders take part in specific content like this: in the conception stage, there are client, users and third parties. In the planning stage, there are client, project team, and third parties. In the production stage, client, project team, producer, third parties involve in. In the

handover stage, client project team, producer, and third parties join in. In the utilization stage, client, users, and third parties. In the close down stage, participants are client and third parties.

## IDENTIFY DIFFERENT STAKEHOLDER VIEW OF PROJECT SUCCESS

Wang and Huang (WANG &HUANG, 2006) spot 3 key project stakeholders in construction project management system. They are project owner, construction supervision company and construction contractor. They measure project success from project cost performance, time performance, quality performance and the relationship among the project owner, supervisor and contractor. They declare that key stakeholder's performance is an important factor determining project success. John Wateridge (John, 1997) gives the users criteria of success is meet users' requirements, happy user, meets budget, meet time, achieve purpose. Project managers criteria about project success is meet user requirements, commercial success, meets quality, meets budget, achieve purpose. Bryde and Robinson (David et al., 2005) compared the measure of success between contractors and clients. They found out clients put more emphasize on satisfying the needs of other stakeholders, while contractors emphasis on minimizing project cost and duration. Adam Collins (Adam & David, 2004) did a survey about different industry project success. The result shows that all stakeholders of project put product satisfy owner's needs as the first criteria. Consultant think meeting specification is the second important criteria for measure project success. Contractors emphasis on project complete on budget. Clients mainly concern about the meeting specification. Contractor rank project complete on time higher than other industries. Wateridge (John, 1997) gives the definition of project success according to different stakeholders. From client view, project is achieve its business purpose and meets its defined objectives, meets quality thresholds, and could make profit for its owner. Project team is happy during the project and with the outcome of the project. Users are happy during the project and with the outcome of the project. Project could make profit for contractors. Stakeholders are happy during the project and with the outcome of the project. Ahadzie and Proverbs,Olomolaiye (Ahadzie et al., 2008) define the success of mass house building projects. For the project, potential success criteria are overall project cost, cost of individual house-units, overall project quality, quality of individual house-units, overall project duration, rate of delivery of individual house-units, technology transfer, overall risk containment on individual house-units, overall health and safety measures, overall environmental impact. For the customer, potential success criteria are environmental impact of individual house-units, overall, health and safety on individual house-units, overall customer satisfaction, customer satisfaction on individual house units.

## BOTH OF THEM DONE

Project success is a full of controversy topic. Khang and Moe (Do & Tun, 2008) give a new conceptual model for not-for-profit international development project. They identify different stakeholders in different project life-cycle phase, and define different life-cycle phases for different criteria. But the criteria are project manager's success criteria, not from different stakeholders view.

## STAKEHOLDER AND STAKEHOLDER THEORY

Stakeholder is first mentioned in management literature in 1963. The source was an internal memorandum at the Stanford Research Institute (SRI). They originally defined stakeholders as "those groups without whose support the organization would cease to exist." The list of stakeholders originally include shareowners, employees, customers, suppliers, lenders, and society (Edward, 1984).While Freeman viewed SRI's definition to be too general and too exclusive to serve as a means of identifying those external groups which are strategically important. He gives a more specific definition of stakeholders in both a broad sense

and a narrow sense. For the wide sense, stakeholder is any identifiable group or individual who can affect the achievement of an organization's objectives or who is affected by the achievement of an organization's objectives. In a narrow sense, a stakeholder is any identifiable group or individual on which the organization is dependent for its continued survival (Edward & David).

Stakeholder theory's original could go back to enterprise responsibility; Adam Smith thought company is input-output system. Owners, suppliers and employees put or afford all this system needed resource then get the product for customers. An enterprise's biggest beneficiary is the investor. While Karl Marx's version presents the ownership model in its most extreme form, with all involved parties, including the customers, contributing resources, effort and money in order to generate benefit for owner-investor (Edward & David). The Stakeholder model is quite different from them. The relationship between the stakeholders and the company goes both ways; Stakeholders afford the resources of the company, and they get returns from the company. We apply this theory to the project stakeholder. Every project stakeholder should get payment from the project, while giving their contribution to the project.

## STAKEHOLDER FRAMEWORK

Given the narrow definition of stakeholders, there are at least eleven stakeholders involved through the real estate project's life-cycle. Its stakeholder framework could be defined as the following:

The real estate developer (Anne & Richard, 2003) is the project sponsor, planner, and manager. He is the coordinator of these activities, converting ideas on paper into reality. He creates, imagines, funds, controls and orchestrates the process of development from the beginning to the end. Developers usually take the greatest risk in the creation or renovation of real estate -- and receive the greatest rewards. Typically, developers purchase a tract of land, determine the marketing of the property, develop the building program and design, obtain the necessary public approvals and financing, build the structure, then lease, manage, and ultimately sell it.

Bank acts as the payment agent for customers to borrow and lend money. Banks are important players in financial markets and offer financial services such as investment funds. They usually take into account project feasibility and the real estate company's reputation before lending money to them.

The government is the body outside any organization has the authority to make and to enforce laws, regulations, and rules. Recently, there has been increasing awareness of the role of government in business. The business-government relationship in the U.S. has been founded on the principles of the "watch dog". In China, when a real estate project is carried out, the developers must obtain permission from many government agencies: the Land and Resource Bureau, Demolition and Remove Bureau, Urban Construction Bureau, Environmental Protection Administration, Development and Reform Commission, Urban Planning Bureau, House and Land Bureau, Administration of Industry and Commerce Bureau. They are responsible for purchasing the land, protesting the environment, preserving history of the area, city development planning, assuring the housing legalities and protecting the customer's benefits.

A contractor, is an individual or a group that contracts with another individual or organization (the owner) for the construction, renovation or demolition of a building, road or other structure. A general contractor is defined as the builder of the prime construction contract for the project. The general contractor is responsible for the means and methods to be used in the execution of the project in accordance with the contract documents. Contract documents usually include the contract agreement and budget, the general and special conditions, plans and specifications of the project that are prepared by a design professional such as an architect. A general contractor is usually responsible for supplying all material, labor, equipment, (engineering vehicles and tools) and services necessary for the construction of the project. The general contractor often subcontract part of the work to other persons and companies that specialize in these types of work. General contractors conducting work for government agencies are typically referred to as prime contractors. The responsibilities of prime contractors are essentially identical to those outlined above. In many cases, prime contractors will delegate portions of the contract work to subcontractors.

Real estate brokers and sales agents are important part of real estate planning and saling sales. They do the macroeconomic market survey, competition project survey, the expert interview, and the target customer interview. They communicate frequently with real estate developer. After that, they devise the details of a sale strategy. They then select an advertising company to market the product, and, sometimes, recruit new employees to sell the product. Brokers also help the prospective buyer to arrange any financing they need.

An architect creates the blueprint, although a group of people may design the structure in its entirety. This group is responsible the whole building, inside and outside. There are many factors for considering, including the style of nearby buildings, any special features what the building will be used for, and how tall it could be.

A company which having the qualification to supervise the real estate project is chosen as supervisor. It ensures that real estate developer and the contractor adhere to the contract. Supervisors make sure the project is on planning schedule and within budget. They guide and supervise the developer handing the project. When the project is completed, they test the quality.

Suppliers support the material needs of the project. Real estate project needs a lot of materials. These include bricks, cement, architectural pottery, kitchen installations, elevators, windows, and a myriad of others.

Property manage company belongs to service industry. Property manage companies are responsible for maintaining the utility and its complete infrastructure. They enhance the security and do the fire control management. They keep the environment clean, keep the green land, management the traffic in the urban area, forbid the cars lost or damage, make the finance management good, write the estate management files, and consult events from the urban management council.

The Media is an important part of the sale of a house. Advertising sends the sale information to many potential customers. Experts may influence customers with their comments on the project. Any bad news could directly influence the house sale.

The customer is the projects ultimate beneficiary. If no one wants to buy the house, the project is a complete failure. Before a project is started, the real estate developer has to identify the target customers, their needs. What challenges do customers face? What do customs hope to gain from this project? What goals are they striving to attain? What experience thrills them? Where do they get their information? Who do they trust most?

**Every stage participant stakeholders as following:**

| initiation | planning | execution | Sale stage | using |
|---|---|---|---|---|
| **Developer**<br>**Government**<br>**Agent**<br>**Customer** | **Supplier**<br>**Government**<br>**Developer**<br>**Contractor**<br>**Agent**<br>**Bank**<br>**Architecture** | **Supervisor**<br>**Developer**<br>**Contractor** | **Developer**<br>**Customer**<br>**Agent**<br>**Media**<br>**Supervisor**<br>**Bank**<br>**Government** | **Estate management**<br>**Contractor**<br>**Customer**<br>**Media** |

# A POWER/INTEREST MATRIX

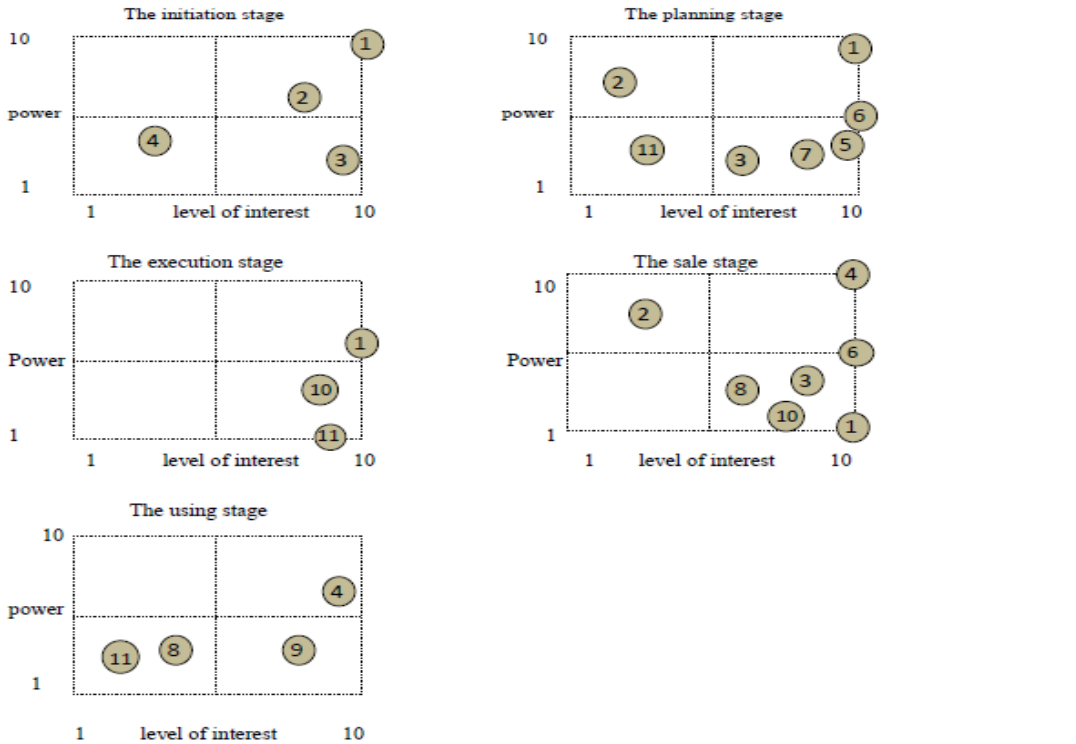
A further way of mapping stakeholder influence is the power/interest matrix. This classifies stakeholders in relation to the power that they hold and their level of interest in the project. The type of relationship, which the project manager will need to establish and maintain with each type of stakeholder grouping, is shown for each of the four zones. Stakeholders with little interest in the project activities and little power to influence them (Zone A) will require minimal effort on the part of the project manager. Those stakeholders in Zone B with a high level of interest in the project's activities but little power to influence them will need to be kept fully informed of the major decisions which have been made, so that good communication with

this type of stakeholder is essential. Stakeholders in the other two zones represent different but equally important problems. Clearly the acceptability of decisions to the key players in Zone D is a major consideration when formulating project strategy but often the stakeholders in Zone C are the most difficult to manage. Their level of interest in the organization's strategies will remain low as long as they feel satisfied with the policies adopted; if they become dissatisfied then, because of their powerful position, they can easily increase their interest and move to Zone D, thus becoming key players. The problem in both matrixes is the re-positioning of stakeholders from Zone C to Zone D. Again the role of stakeholders in Zones A and B needs to be monitored and controlled, although lacking in power, they may have disproportional influence on the more powerful stakeholders.

| | Level of interest high | Level of interest low |
|---|---|---|
| Level of power low | A minimal effort | B keep informed |
| Level of power high | C keep satisfied | D Key player |

Mendelow (Tuman, 1993) has presented a model of environmental scanning in the context of the stakeholder concept, and includes the dynamism of the environment and the power of the stakeholder relative to the organization or the project.

This model based on which stakeholders possess power relative to an organization is liable to change, and the change depending on the impact which the stakeholders-environment has on the stakeholders-basis of power. The model that is presented consists of a grid where power and dynamism are relevant factors. Power ranges from low to high, and dynamism ranges from static to dynamic. A tactic environment implies that there is little likelihood of the stakeholders to alter their power base, and a dynamic environment may lead to alterations in the bases from which stakeholders derive their power. This paper uses this model as the analysis tool to identify different stakeholder influence of all project life-cycle. We interview 11 people who almost working relate with real estate industry. 45.5% are real estate developer.9.09% are contractor, 9.09% are architecture, 9.09% of them work at the government agency, 9.09% work in the media. Their answering results like the following figure.




1.real estate developer, 2.government, 3. Agent, 4. Customer, 5.supplier, 6.bank,7.architecture, 8.media, 9.estate management, 10.supvervisor 11.contractor

So we the key stakeholders and specific their success criteria at different stage as following:

| **Initiation** | **planning** | **execution** | **Sale** | **usage** |
|---|---|---|---|---|
| Developer<br>*Make profit*<br>***NPV,IRR,PI***<br>*Feasible for developing a project*<br>***Land resource***<br>***Nearby community condition***<br>Government<br>*Reasonable use land resource*<br>***RC;GLCR;BD;BH***<br>*Get land fee*<br>***Reach bit line or more*** | Developer<br>*Get government permission;*<br>*Complete land resource*<br>***Water, electricity supply, transportation connection***<br>Bank<br>*Make profit*<br>***DR,DFA,DPF*** | Developer<br>*As schedule;*<br>***RCP;CT;SC;TV***<br>*As budget;*<br>***UC***<br>*As scope*<br>***RORD***<br>*Safe and health*<br>***AR***<br>*Quality*<br>***Build in good standard***<br>***Build in proper procedure*** | Customer<br>*Reasonable price;*<br>***CP***<br>*Living Cost*<br>***COPM***<br>*High quality;*<br>*Good location;*<br>***TC***<br>*Increase value ability*<br>Bank<br>*Get debit*<br>*As contract*<br>***RR*** | Customer<br>*Function as before*<br>***BROY***<br>*Good property management*<br>*Safe*<br>***CROY***<br>*Good environment*<br>***Noise, air, green land keep condition*** |

Now we specific these success criteria.

①At the initiation stage, real estate developer judge a project could make profit or not by following metrics:

**Net present value = Present Value of Future Cash Flows -Initial Investment** If NPV>0, accept it.

**Profit index=Present value (cash inflow)/Present value (cash outflow)** If PI>1, accept project. IRR is the rate of return to a project which just equates PV(cash inflows) to PV(cash outflows) **If NPV(r1)=m, NPV(r2)=n IRR=r1+(r2-r1)*(0-m)/(n-m)** When r > k: accept the project.

Next real estate developer make sure project is feasibility. Such as land resource is good for developing. It include **land geology condition, transportation, electricity, gas, water, communication supply situation,**

Nearby community condition could be measure by **education organization numbers, hospital numbers, nearby transportation system.**

Government success criteria could be defined as following:

Reasonable use land resource,

**Rate of capacity= all build up area/land area**

**Green land cover rate=green area/land area**

**Building density=all building base area/land area**

**Building height**

Government would make sure to get the land fee is more than they set the bid line.

**Land fee>=bid line**

②At the planning stage, real estate developer and bank are the key stakeholders of project.

Developer should get the permission from government. If they can't get the permission, project can't be carried out. After they do this, they have to complete the land resource, prepare for starting the project. At this stage, **water supply, electricity supply, transportation connection** should be complete. Then make the land **flat** to ready for construction.

Bank decide whether lend money to the develop depend on **project IRR, developer's fix asset, developer's present flow, developer's reputation**。

③At the execution stage, developer is the key stakeholder. Albert Chan (David et al., 2005) gave us many criteria to measure construction project success. There are as following:

Time measurement

**Construction time=Practical completion date-Project commencement date**

**Speed of construction=Gross floor area ($m^2$)/Construction time (days/weeks)**

**Time variation= (Construction time-Revised contract period)/Revised contract period*100 percent**

While Revised contract period=Original contract period +EOT

Cost measurement:
**Unit cost=Final contract sum/Gross floor area ($m^2$)**
Scope change measurement:
**Rate of redo it=re do work/all work**
Health and safe measurement:
**Accident rate= (Total no. of reportable construction site accidents)/ (Total no. of workers employed or man-hours worked on a specific project)*1,000**
Quality could be measured by **building standard** and **building process**.
④At the sale stage, customer is the key stakeholder. Their measurement about project success is as following:
**Price,** compared with nearby same level building sale price. And they would consider the living cost. It is cost of property management.
**Location** is measure about public transportation situation and whether it is convenient for householders and other to get this place.
**Rate of capacity** is compared with around building parameter. Rate of capacity is the lower the better.
**Community utilities is about** around area whether there are many schools, hospital numbers, , restaurants, supermarkets, play ground for sports.
**Reasonable House layout** means sitting room, living room, kitchen, bathroom areas are fit for life. The room has enough sunshine. The room is bright enough. Every room area design could be accepted by majority.
**Increase value ability** means customers expect the house's price would increase in the future. That is another feature of house. Except as a living place, house could as an investment method.
Bank measure project success is to check real estate developer money return situation, so measure project success by **return rate.**
⑤As the using stage, customer think the success project should be all function could work as before.
And they can get the good property management. So following criteria are included.
Function as before means the all machines work well, such as elevators, road lights. It could be measured by **rate of broken equipment=one year broken equipment No. /all equipments No.**
**Safe** means this community is security. We can measure it use **criminal rate in one year.**
**Good environment** means **less noise, clear air**. **Green land** maintains condition.

# CASE STUDIES

The stakeholder view of project life-cycle success measurement framework is developed in this study. In order to demonstrate the application of measurement framework in the real estate industry, two case studies are presented. Every case is about real estate project life-cycle key stakeholder measurement. Table shows the summary of the background information and the result of this measure framework. The details and the explanations of each case will be discussed next.

## Case 1

This project is in Foshan of Guangdong province. It is a 30,000 square meters area. Total area of building is 68,000 square meters. The main product is high building. Every apartment area is more than 150 square meters. The biggest is 320 square meters. There are altogether 180,000 car parking lots, with associated access roads, site work and landscaping.

①At the initiation stage, according to project feasibility , **IRR**=26.4%.
Land ground belongs to **level II.** It is **stable background**.
There are **four city roads** nearby. In the future there would be a **subway station.**
It is very **easy** to get the electricity, water, gas supply.
There are two primary schools, one east hospital, book shopping center, sporting center, China Construction bank nearby. Transportation is very convenient. Two bus stations are in the nearby.
For Government **Rate of capacity= 2.3**

**Green land cover rate=40%**
**Building density=24%**
**Building height<=80meters**
Bid land price is more than 507,100,000 RMB.
Last the cost is 553,100,000RMB.

②At the planning stage, they get all the permissions from government. They complete water supply, electricity supply, transportation connection, and flat the land. In this project, project developer has enough money, so they don't have to borrow the money from bank.

③At the execution stage, for developer, time measurement
**Construction time=56months**
**Speed of construction=742987square meters/52 months=476m$^2$/day**
**Time variation= (52-48)/48*100 percent=8.3% while** Original contract period=40
Cost measurement:
**Unit cost=2000RMB/square meters**
Scope change measurement:
**Rate of redo it=7%**
Health and safe measurement:
**Accident rate=0,** but government did the examination, and found their work place have the hidden trouble.
About **building standard and building process,** we can't get the information.

④At the sale stage, the price is higher than the nearby place. Good location, transportation is very convenient**. Cost of property management=2RMB/square meter in one month.**
**Rate of capacity=2.3**
There is a gym square, testimony primary school, five-star hotel, thousand-lights-lake park, south ocean square nearby.
House layout is reasonable, and the using area is very big. It is right design for the big family to use.
According to the average price from November 2008 to July 2009, totally speaking, the house **has the increase value ability.**

⑤As the using stage, customer think the success project should be all function could work as before.
**We can't get the equipment broken rate**, c**riminal rate in one year. Noise and air condition we all can't get this information.** But this project property management got the prize from government. They measure the service by foundation management, house management and sustain management, public facility management, security, fire alarm, traffic management, environment management, green land management and so on.
In all, this project is a very successful project.

## Case 2

This project location is in Beijing center district. It was developed by Zhongshun Real Estate Company. The total area of this building is 68,000square meters, 750 apartments.

①At the initiation stage, according to project feasibility , **IRR**=25%.
Land ground condition situation can't be getting.
Transportation is very convenient.
It is very **easy** to get the electricity, water, gas supply.
Around here there are many schools. A hospital locate nearby, many banks. For this land location is the center of Beijing. Community is developed very mature.
**Rate of capacity= 2.27**
**Green land cover rate=30%**
**Building density can't be getting.**
**Building height can't be getting.**
Bid land price can't be get

Last the cost is 951600, 000RMB

②At the planning stage, they get all the permissions from government. They complete water supply, electricity supply, transportation connection, and flat the land. In this project, they would lend money from the Bank. And it would pose 70% of all the cost. The number is 200,000,000rmb, decide whether lend money to the developer depend on **project IRR=25%, we can't get developer's fix asset and developer's present flow.**
**This is a small real estate develop company.**

③At the execution stage, for developer, time measurement
**Construction time=36months**
**Speed of construction=**68,000**square meters/24months=94m$^2$/day**
**About time variation, we can't get.**
Cost measurement:
**Unit cost=7000RMB/square meters**
Scope change measurement:
**Rate of redo it we can't get it.**
Health and safe measurement:
**Accident rate=0,**
About **building standard and building process,** we can't get the information.

④At the sale stage, the price is higher than the nearby place. Good location, transportation is very convenient. COPM=2RMB/square meter
**Cost of property management=3.5rmb/square meter** in a month.
**Rate of capacity=2.3**
Some Houses layouts are not good, but most of them are good.
The average price in October 2007 is 20,000Rmb/square meter to January 2008 250,000RMB/Square meter, totally speaking; the house **has the increase value ability.**
**About developer return money back to the bank data, we can't them.**

⑤As the using stage, customer think the success project should be all function could work as before.
**We can't get the equipment broken rate**, c**riminal rate in one year. Too noisy and air quality is not good.**
In all, this project is a success.

# CONCLUSIONS

This paper developed a new framework for measuring project success. The key feature is set the different success criteria for the different stages of project life cycle. For each phase of the project, the explicit list of success criteria is developed based on literature review and interview from the person who working in this field. And using the interest/ influence matrix as an analysis tool to determine which stakeholder play the important roles for projects.

This paper mainly talks about real estate projects. The framework helps fill the knowledge gap in the studies of real estate project management application area. Real estate project has its own features. Key project players involves and their roles in the different phases of the project. This could help developers manage the project more successful.

The framework could help the practical. It shows that different stages have different success criteria. They are changing all the time. They are not only include time, cost, and quality these three basic and most important performance indicators in real estate project, but also include other measurements such as safety, living conditions etc.. The framework presents a practical monitoring and evaluating tool that can be used from the project beginning and to the project ending.

The analysis based on the many papers reviewed and interview from persons who working in real estate project. The framework provides a useful framework for measuring and comparing project performance for future studies. And different stakeholders could use it to help a project successful.

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