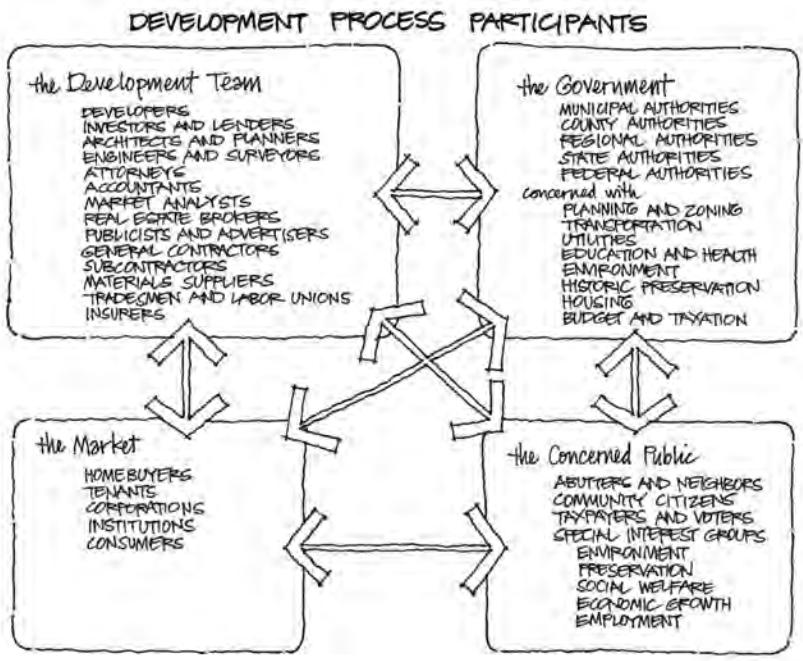
8 The Building Process and the Architect's Role

Architecture as a regulated profession is relatively new yet there have been architects for as long as humans have built settlements, with little distinction between designers and builders. In ancient cultures and languages, the same word was used for *architect* and *builder*. Erecting structures from foundation to roof was an integrated craft. The master mason or master carpenter could design, assemble labor and materials, estimate costs, and oversee construction. Thus the first people to provide shelter for themselves and for others became, in essence, the first architects. Anyone able to conceptualize, draw geometric forms, and construct such forms without subsequent collapse was an architect.

The industrial revolution changed the building process. New materials, new machines, new engineering techniques, and new building requirements made it increasingly difficult for any one person or organization to master every facet of building design and construction. Specialization was inevitable. New and technically complex structural systems demanded expertise beyond that of a master mason or master carpenter. The proliferation of highly specialized subcontractors redefined the role of the general contractor, whose own labor force built less and less of the building. The complexities of construction increasingly became matters for experts complementing the efforts of the architect.

The first school of architecture in the United States was established at the Massachusetts Institute of Technology in 1868, and architecture was soon recognized as a learned and governable profession when states enacted legislation for licensing architects. Since then, the practicing architect's territory has evolved,

becoming at once broader in types of projects but increasingly circumscribed in professional responsibility. Today, architects design buildings, aggregations of buildings, entire towns, and parts of cities but they do so as leader of or key player on a large team of highly specialized engineers and other design consultants. The more specialized the project, the more specialized consultants are needed. In addition to the architect, a project team may include civil, structural, mechanical, and electrical engineers; landscape architects; interior and graphic designers; experts in lighting, acoustics, security, building code analysis and interpretation, traffic, and transportation; and, depending on the project type, specialists focusing on health-care facilities, performing arts design, historic preservation, retailing, and structured parking.



Nevertheless, the traditionally unique role of architects in society is generally well understood. Architects are artists and technologists whose design talents yield buildings with beauty, stability, utility, sustainability and, it is hoped, cost-effectiveness. The successful architect presumably is hardworking and creative but he or she also is expected to possess extensive engineering knowledge, organizational and managerial ability, political sensitivity, legal acumen, negotiating and marketing skills, economic and accounting know-how, and even social influence and business connections.

Nevertheless, this all sounds generalized, not specialized. If architects are obliged to be so professionally ambidextrous, why are they no longer traditional master builders? The answer is best given by exploring the process through which buildings are created and identifying all the participants in that process. The role of those who practice architecture, the art and science of building design, will then be clear and comprehensible.

How Projects Get Built

Need

The old saw, "necessity is the mother of invention," tells why most building projects get started: recognition of an unmet existing or future need. For projects intended to generate profits for project developers and owners, economists characterize such need as market demand. For most nonprofit, institutional, cultural, and governmental projects, need is attributable to noncommercial human activities, desires, and motivations. In all cases, no project comes to life unless some number of people, perhaps with differing perceptions and goals, agree that there is a real need for whatever is to be built.

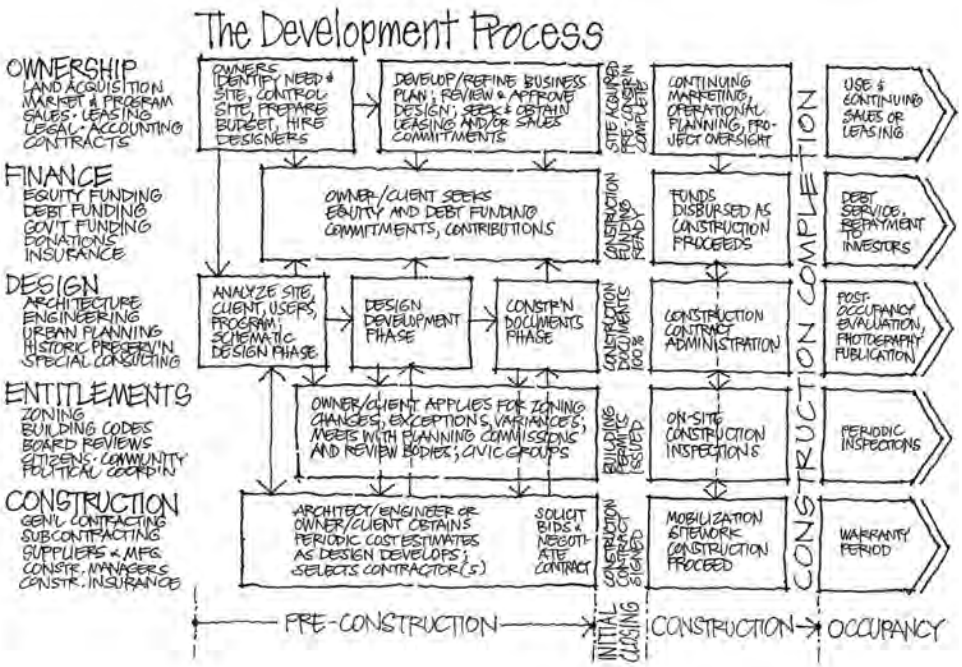
In architectural parlance, project needs are usually expressed as a written program or brief. The program document embodies

in detail specific project aspirations, goals, and requirements that, if met, will adequately fulfill the identified need. Thus a well-written program generally includes a thorough description of functional, aesthetic, social, cultural, and other objectives; a list of all operational activities to be accommodated; written descriptions and graphic diagrams showing functional and spatial interrelationships; an associated menu of rooms, spaces, and related floor area requirements (measured in square feet or square meters); special technical, furnishing, and equipment requirements; and any other stipulations affecting the project's design.

The process of design can commence once the project need is verified, the program is established, front-end funding has been obtained, and usually after the project site has been selected. The diagram that follows illustrates this building process, although not from the point of view of the architect. Instead, it shows the process from a position of neutrality, giving no special weight to any particular segment. The diagram is somewhat simplified yet comprehensive and it includes steps that may be inapplicable to certain kinds of projects. It also does not show time and activity durations in a proportional way because these vary widely from project to project. The important dimensions of the diagram are the number and interrelationship of activities.

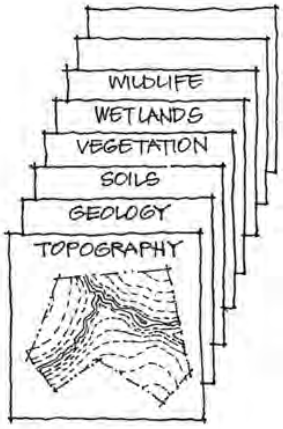
Site

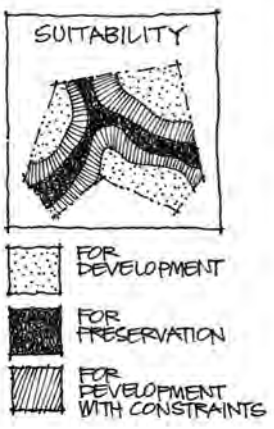
Along with definition of project need comes the site, the place to meet the need. Few projects can be contemplated without a place to put them. Nevertheless, a project may be envisioned before a site is chosen and conversely a site may be in hand before the need to improve it is established. The architect's client undertaking development of a project must eventually have control of the project site prior to construction by either owning it or leasing



it from its owner. Sometimes the architect's client has owned the project site for a long time but frequently the client only has a contract to acquire the site, be it a small lot, an old building to be remodeled, or a parcel of several acres.

The selected site must be surveyed and thoroughly analyzed. Surveys document the site geometry and all existing physical conditions: property boundaries; topography; vegetation; structures; easements; rights-of-way, roads, and utilities on or abutting the site; soil and seismic conditions (rock formations) ascertained through test borings; and hydrological features and conditions. All these data are indispensable for the architect and consulting engineers, who must make crucial design decisions about creative use of the site and location of new construction because many sites encompass areas unsuitable for building.





Development Costs and Financing

With project need and site identified, the architect's client must then assemble the resources and expertise required to transform ideas into reality. The essential resource is of course money to pay for all of the costs incurred in project development: site acquisition costs; site surveys and analysis; architectural, engineering, and other design fees; legal and accounting fees; project administration costs; market or needs analysis costs; financing fees and interest on construction loans: advertising and public relations expenses; selling and leasing costs; insurance premiums; costs of obtaining regulatory entitlements—zoning approvals and building permits; and construction costs for all the labor, material, and equipment needed to build. These expenses will be incurred for any project, from building a house to building a new town.

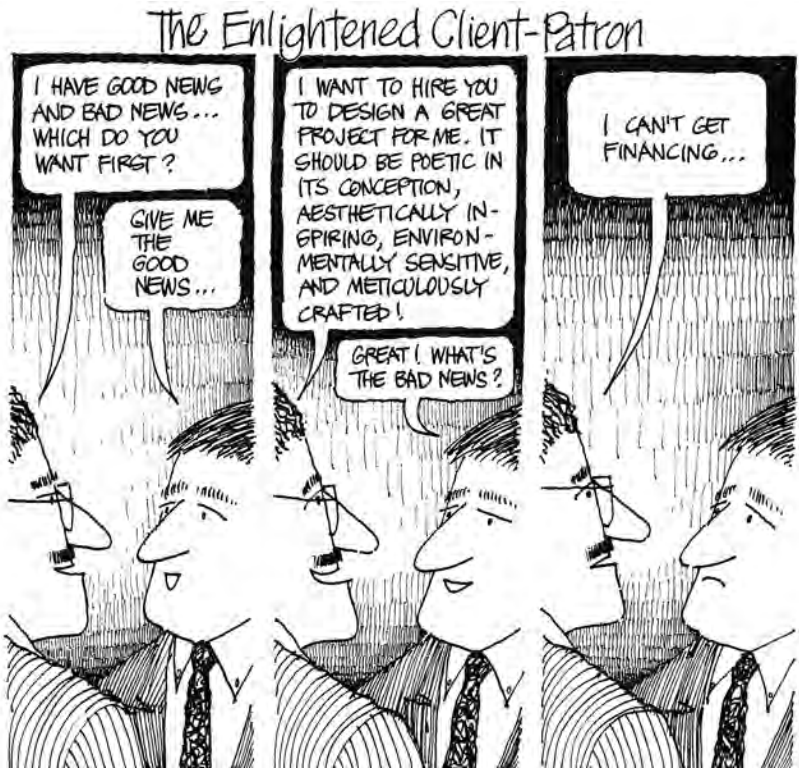
All costs must be covered by project financing, a critical piece of the development puzzle. Without financing, nothing can be built. There are two types of financing: equity funding and debt funding. Equity funding represents at-risk monies that the client

invests out-of-pocket or from the pockets of investment partners or development company stockholders. If an income-producing project fails, the at-risk equity invested may never be recovered.

Debt funding comes from institutional lenders—banks, insurance companies, pension funds, credit unions, or real estate investment trusts. The client, as owner and borrower, has a legal obligation to repay the debt, plus interest, within a specified period of time, evidenced by a promissory note and mortgage document. As security for the loan, borrowers typically pledge the real estate—land and improvements—as collateral, and sometimes they may be required to pledge additional assets as loan collateral. The term *mortgage* refers to a loan specifically collateralized by the real estate for which the loan is used. Loans are generally obtained through mortgage brokers or investment bankers, who act as intermediaries between institutional lenders and borrowers. Federal, state, city, and county governments sometimes make loans directly to owners to develop special kinds of projects deemed to be in the public interest, such as low-income housing or job-creating industrial or commercial facilities.

Citizens lend money directly to government agencies by purchasing bonds, which are IOUs issued by state, county, and municipal governments to finance various public projects such as schools, hospitals, highways, or other kinds of infrastructure. Interest on such bonds is usually nontaxable. Ultimately citizens supply the money for all construction, private or governmental, because funds invested in real estate derive mostly from individual savings entrusted to lending institutions. If people did not save, there would be no pool of capital available for debt financing and very little construction would occur. Indeed, 75 percent or more of the costs of privately developed projects are typically paid for with borrowed money. Thus the availability and cost of credit in our

economic system is inexorably linked to the building process and directly affects the welfare of architects.



Not all projects depend on the credit market and loans. For noncommercial projects developed by nonprofit institutions, funding comes from endowments, capital campaigns generating pledged donations from contributors, foundation and corporate grants, sale of marketable assets, or government agency budget appropriations. Most museums, performing arts centers, government and other civic buildings, religious structures, and public education facilities are built without mortgage financing.

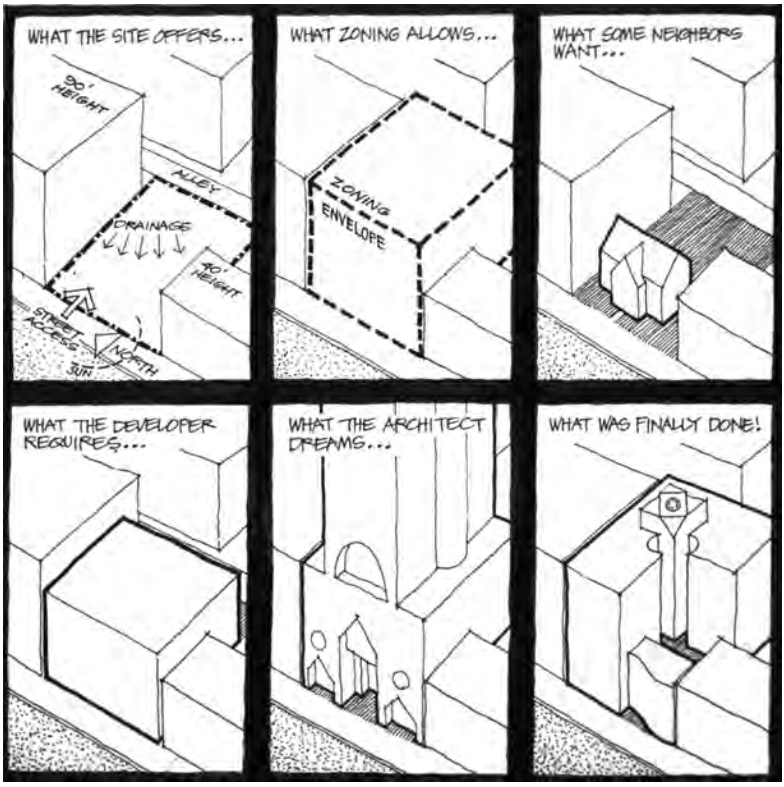
Virtually all funding of such projects is equity, with little or no debt financing involved.

Design and Design Approvals

As the client wrestles with the intricacies of raising capital for building, the architect begins studying and developing fundamental project design concepts. As a definitive design crystallizes, the architect must increasingly take into account hundreds of potentially conflicting factors: detailed program requirements, site conditions, construction budget constraints, and regulatory criteria—not to mention the aesthetic tastes and idiosyncrasies of architect and client. Zoning ordinances, building codes, and environmental regulations govern building uses and densities, building configuration, engineered systems performance, life-safety provisions, and parking, usually prescribing in what is legal and not legal on the project site. Accordingly as project designs become definitive, they are reviewed by multiple agencies of government, which are solely responsible for granting final approvals and permits to build, commonly referred to as *entitlements.*

Yet citizens or civic groups indirectly may have a say, especially if a project entails public hearings to consider desired zoning or master plan changes or requests for special exceptions or variances. Citizens may oppose new projects and associated changes for a variety of reasons: anxiety in general about change that increases density, land use, or building heights; concerns about traffic congestion and parking; worries about property values and neighborhood character; potential overloading of existing infrastructure, especially public schools; perceived threats to historic resources; and sometimes dislike of proposed architecture. Another reason for opposition, usually unstated, is fear that a

proposed project will bring into the community people who are "different," a code word for those of lower socioeconomic status.



Thus building permit department reviews prior to construction are only part of the entitlement process. In many counties and municipalities, there can be several review boards and board hearings, plus endless community meetings. And each reviewing entity may have its own unique schedule, procedures, and design criteria. Usually, seeking entitlements is carried out as a team effort, the team consisting of designers, client, client's attorney, and other expert consultants such as civil and

transportation engineers, economic analysts, and environmental scientists. Obtaining project entitlements can entail enormous amounts of time, patience, dialog, persuasion, and sensitivity, and it can be very costly. Extended delays are not unusual for controversial projects, many of which rest quietly unrealized in the file drawers of architectural offices.

Engineers and Other Design Consultants

Engineers play a critical role in the design process. As the architect develops a building's overall form and three-dimensional geometry, structural engineers analyze load-bearing portions of

the building—the skeletal frame, footings and foundations, walls, floors, and roofs—specifying components, dimensions, types of material, and connection details for the entire structural system. Likewise mechanical engineers begin designing the building's heating, air-conditioning, ventilating, plumbing, and electrical distribution systems once the architect has provided a preliminary design that approximates the intended, final architectural product.

Based on topographic, boundary, soil, and other surveys provided by licensed land surveyors, the architect prepares a preliminary site plan from which civil engineers can begin site work design: clearing, excavation, and topographic regrading; layout and construction details for roads, bridges, parking lots, walkways, and bike paths; storm water management systems, including drainage inlets and catch basins, manholes, storm water pipes, dams, retention areas, and bioswales; water supply and sanitary sewer systems; and other site utilities or structures. Their engineering work clearly depends on the proposed location, shape, and size of buildings. In the case of residential and industrial subdivisions, sometimes civil engineers, rather than architects or landscape architects, prepare preliminary site plans from which final engineering proceeds.

In addition to engineers, architects and their clients regularly hire landscape architects. Some landscape architects prefer large-scale projects (urban and suburban master plans, highways, residential subdivision layouts, plazas, and parks), their services overlapping with civil engineers and architects. But many practice at the smaller scale of gardens and building landscapes. More horticulturally oriented, the latter concentrate on selection, layout, installation, and maintenance of diverse plant materials (trees, shrubs, and ground covers), along with water features, masonry walls and terraces, fences, walkways, outdoor furnishings, and exterior lighting. The architect may call on the landscape architect

to provide a complete landscape plan for a building site or only to advise about basic plant material selection. Very few architects are sufficiently knowledgeable about horticulture and local ecology to assume this responsibility, although they usually make basic decisions about overall site layout.

Other specialized expertise frequently supplements the usual structural, mechanical, electrical, civil engineering, and landscape architecture services. Projects such as theaters, schools, hotels, hospitals, embassies, museums, airports, parking garages, and occasionally houses can pose unique technical challenges. Acoustical engineers, for example, deal with control of sound, its quality, and its transmission, reflection, and absorption. Lighting consultants are concerned with illuminating interior and exterior environments, using daylight and electric lighting. They focus on the aesthetic quality, intensity, deployment, and distribution of ambient as well as task lighting. There are consultants for theaters, kitchens, health-care facilities, security, information technology, signage and graphics, building code interpretation, and life-safety issues. Sustainability and environmental consultants help project design teams in making buildings greener and more energy efficient and also in obtaining sustainability certifications. Whatever the project, it is always the architect's responsibility to coordinate and be conversant with the work of these disparate design consultants.

Finally comes the interior designer or decorator, with whom potential design conflict frequently exists from the architect's point of view. Hardly an architect breathes who does not consider himself or herself to be a qualified interior designer (some architects refer to interior *desecrators*). It is a lopsided struggle because architects can do interiors but interior designers cannot do architecture. This struggle has further played out in a territorial dispute between architects and interior designers, generally

considered unqualified to do work affecting the structural system or other building systems. Modifying architecture naturally was deemed the sole design province of licensed architects, who feared that interior designers, if licensed, might be able to offer services that only architects could offer legally. In any case, usually the client, not the architect, retains interior designers to specify interior cosmetic finishes and furnishings, without changing the architecture. What can make life difficult is a lack of clarity as to where architectural design stops and interior design begins. Nevertheless, fruitful collaborations occur.

In custom residential and commercial projects such as office buildings and hotels, owners frequently hire interior designers to help select furniture and upholstery, carpeting, paint colors, wall coverings, window treatments, lamps, decorative accessories, and occasionally artwork. Consequently the architect's work stops at shaping the building and spaces within to contain and serve as background for the interior designer's layers of decor. Similar to any other consultant group, there are talented and less talented interior designers, some of whom are also architects. For the building architect, the best tactic is to design interior spaces that are visually compelling and resistant to decorative excess and then to persuade the client to consider the interiors an integral part of the architecture.

You might now be wondering about the legal and financial relationships between expert consultants and the architect and other participants in the building process. Most expert participants operate as independent consultants, either retained by the architect as subcontractors or hired directly by the client. Consultants hired by the architect are responsible to and compensated by the architect. This relationship gives the architect more control over the actions and decisions of consultants because the consultants must rely on the architect not only for direction but also for payment of their fees, clearly giving the architect economic leverage.

However, the architect assumes legal and financial responsibility for the work performed by such consultants because, from the client's point of view, the architect is furnishing the services, there being no direct relationship between the client and the consultants. Further the architect, not the client, is obligated to pay for the consultant's services, and unless the consultant agrees otherwise, the architect must compensate the consultant even

if the client fails to compensate the architect. Prudent architects usually insist that payment by the architect to the consultant be contingent on payment by the client to the architect.

When consultants work directly for the client, the architect may lose some control over what the consultant does, but only if such control is voluntarily relinquished. If the architect establishes and maintains an effective working relationship among all parties, this form of contractual relationship can be advantageous to everyone. The architect is better off because he or she does not assume the responsibility, legally or financially, for the work of other experts, work that the architect is usually not qualified to perform. And the consultants' fees are paid directly by the client without going through the architect. Nevertheless, under either arrangement, it is the architect's job to coordinate all design services, a task greatly facilitated and made more reliable through the use of advanced design methodologies such as building information modeling.

Some design firms combine architectural and engineering (A/E) services under one organizational umbrella. Their staffs may include not only architects but also landscape architects, urban planners, interior designers, structural engineers, mechanical and electrical engineers, civil engineers, and construction cost estimators. These groups of in-house experts play their respective roles to some extent as if they were independent professional consultants. Because they all work for one firm, project coordination and communication are facilitated, although occasionally internal disputes and competition for control arise. Nevertheless, to clients, it offers one-stop shopping for building design services. Some of these firms even offer construction management, market analysis, and real estate project feasibility services along with comprehensive A/E design services. The only

thing they do not offer the client is financing. Partly because of their size and multidisciplinary service approach, the United States' largest A/E firms, although a small percentage of the nation's architectural firms, design a large percentage of the nation's construction.

One other kind of consultant has come into being in recent decades, thanks to the Internet and enhanced telecommunication capabilities: geographically remote architectural service firms that provide cost-effective and time-saving production services. Firms in China, Southeast Asia, India, North America, and elsewhere can create diverse design products—perspective renderings, videos, construction drawings, digital and analog models—more cheaply and often faster than undertaking the work locally or in-house in the United States. An architectural firm in Boston, New York, Washington, Chicago, Los Angeles, or Seattle, especially if very busy, can send digital data files to distant locations anywhere on the planet. When outsourced work is completed, remote service providers can instantly send back completed drawings in digital form to be immediately reviewed, plotted, and presented. Of course, the remote service provider may not do everything perfectly but that occurrence is diminishing as technologies improve.

Brokers

Several types of brokers—go-between agents who help buyers find sellers or, more usually, sellers find buyers—may be involved in project development. Mortgage loan brokers help borrowers find lenders. Real estate brokers help property owners sell property or assist developers find and acquire property for development. Other real estate specialists concentrate on leasing, putting together

landlords (lessors) and tenants (lessees), and some assist owners of leased property in managing such property.

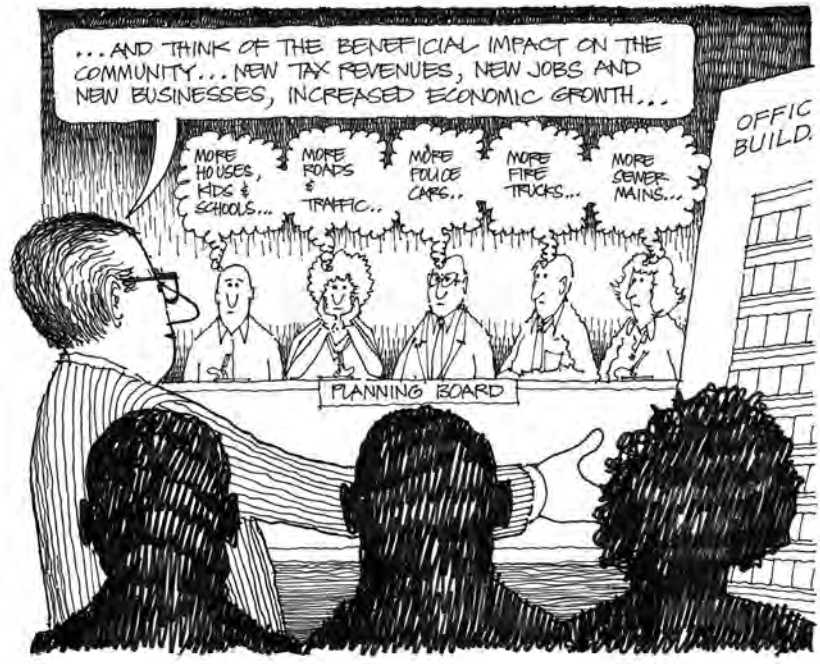
All brokers and property managers earn fees for their services, usually a percentage of the selling price or rents received. Architects are frequently surprised and chagrined by brokers' fees, which for a given project can exceed architects' fees for what appears to be significantly less work, less difficult work, and work entailing much less financial risk. This differential reflects the relative market value our economic system places on each service, not necessarily the cost or uniqueness of the service.

Attorneys

Some projects are legally complex because of ownership structure, financing, or regulatory complexities. From the client's viewpoint, the array of legal relationships defined by written or verbal contracts complicates the development process but is unavoidable and at times indispensable. Attorneys draft contracts and provide ongoing legal advice necessary to cope with business and legal complexities, especially related to taxes, throughout each step of project development. Some attorneys are very effective, serving as deal makers, whereas others can impede progress, turning into deal breakers. Inevitably architects have to interact with somebody's lawyer, if not their own.

Attorneys also frequently play a major role in the entitlement process, when project implementation requires petitioning for a zoning change, special exception, or variance. They may formulate the entitlement process strategy and manage preparation of special studies and testimony for public hearings conducted by zoning and planning commissions, city and county councils, and official review boards. To cultivate favorable opinions and positive action

by elected and appointed public officials, many attorneys also engage in behind-the-scenes and presumably legal lobbying, which can be quite effective in obtaining approvals.



Construction Contractors and Managers

Of all the relationships and contracts, none is as critical to successful project realization as those between owner and general contractor. Construction is the largest single development expense. Direct construction costs, along with land costs and loan interest, can account for as much as 90 percent of total development expenses, with the balance composed of fees, taxes, insurance, marketing, and administrative overhead.

The role of the construction contractor is paramount, not only because this is the most costly contract but also because the efficacy and quality of construction have great impact on

the economic, technical, and aesthetic outcome of the project. Architects are very concerned with construction and those who perform it because the realization of their design and their client's satisfaction depend substantially on how well builders build.

Except for very small, simple projects, such as enclosing a screen porch or building a patio, several construction firms, in addition to the general contractor, are required to carry out the work. Specialization has been taken to its limit in the construction industry. Virtually no general contractor can perform all of the tasks required to build a project, even a modest one. Thus general contractors depend on a collection of independent subcontractors to perform specific pieces or phases of the construction work. They further depend on dozens of separate suppliers to furnish hundreds of different materials and pieces of equipment.

For example, just to build a house, although a general contracting firm would probably have its own supervisory, carpentry, and unskilled labor force, it nevertheless would depend on the following subcontractors, labor trade specialties, and suppliers to fully execute the construction contract:

Site clearing and excavation
Site utilities
Masonry
Concrete
Plumbing
Heating, ventilating, and air-conditioning
Electrical
Lumber and millwork
Structural steel
Miscellaneous metals
Doors and windows
Glass and glazing

Roofing
Lighting fixtures
Drywall and plaster
Painting
Tile work
Flooring
Paving
Landscaping

For larger, more complex structures such as office buildings, schools, museums, art centers, hospitals, or transportation terminals, the list would expand to include the following:

Foundation sheeting and shoring
Steel mills, shop fabricators, and erectors
Concrete precasters
Glazed curtain walls and storefronts
Elevators and escalators
Specialty suppliers (security systems, audiovisual equipment, signage, etc.)

General contracting is a kind of brokering operation. A contractor studies the architects' and engineers' project drawings and specifications; distributes them as digital files or hard copies to prospective subcontractors and suppliers, who submit cost estimates and bids for furnishing and installing everything within their respective work scope; and then, after totaling all labor and material costs, adds a fee to cover the general contractor's overhead and profit. This produces a lump sum amount representing the direct cost of project construction.

In some projects the contractor is selected during the early design phases, working closely with the architect and client to monitor probable construction costs, and a final construction

contract is negotiated as detailed drawings are completed. This process can save time and potentially money because the contractor participates in making cost-affecting design decisions. Many times, however, it is in the client's interest to solicit competitive bids from several general contractors. Although this process takes more time than the negotiated contract approach, it can yield the lowest price if the construction market is soft and contractors are reasonably competitive and anxious to bid. Prudent owners and architects usually award the contract to the lowest bidder who is financially and technically qualified.

No matter which contractor selection method is employed, the initial lump sum construction cost often exceeds the project construction budget. Because most project budgets are relatively inflexible, architects, clients, and contractors undertake value engineering (VE), a euphemism for prudent, sensitive cost cutting. VE methodology entails combing through drawings and specifications to scrutinize in detail all aspects of a building's design. The VE team searches for anything and everything that can be acceptably eliminated, changed, or reduced in quantity and quality to save money and meet the budget, yet without unduly compromising the project's overall quality and value—thus the term *value engineering*. VE can affect all of a building's systems and materials but it doesn't necessarily affect a building's overall aesthetic form. However, if the cost overage is sizable enough, the building as a whole may require major surgery.

Once a contract is signed, the general contractor orders and purchases the needed materials, executes subcontracts, organizes and coordinates suppliers and subcontractors, and, in effect, sells the project to the owner at a marked-up price. Construction is supposed to be carried out in strict accordance with the architect's plans as approved by the client and by government agencies and

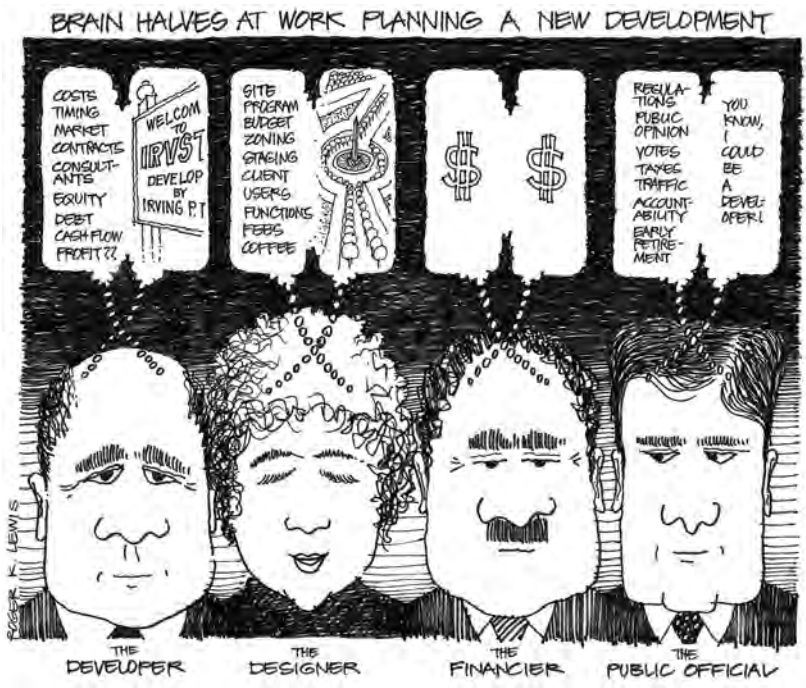
project lenders. However, general contractors, similar to every subcontractor and supplier, have one primary business motive: to make a profit. Therefore their goal is to buy low and sell high, putting them into periodic conflict with the architect and owner, whose objective is to get the most for the money from the contractor. This is why project owners, architects, and contractors are usually separate entities linked together only by contractual agreements, with the architect being primarily responsible for protecting the client's interest and simultaneously being fair to the contractor. In fact during construction, the architect has an obligation to resolve disputes objectively between owner and contractor, even if it means siding with the contractor.

Occasionally an owner will decide to hire a construction manager (CM) instead of a general contractor. A CM acts as a consultant, performing essentially the same bidding, supervisory, and coordination functions as a general contractor but usually without a legal obligation to deliver the project pursuant to a single contract for a single, lump-sum price. The CM, acting as an agent, negotiates with all the subcontractors and suppliers on behalf of the owner, who consequently signs dozens of separate contracts. This relationship does not always prove favorable for either the owner or the architect. With so many contracts to administer, the management and accounting burden is much greater and the architect is often forced to spend excessive amounts of time on coordination and documentation during construction. Further, because there is no general contractor with overall project responsibility, it is easier for items to fall through the cracks of responsibility between subcontractors.

Role-Playing

Different roles in the building process may be played by a single individual or entity. For example, an architect's client may act as general contractor. Developers who build housing or commercial projects may have their own construction contracting department, design department, financing brokerage, real estate brokerage, property management department, or accounting and legal staffs under one corporate roof. Other developers are literally one-person operations, requiring only up-to-date telecommunication and digital devices; a long list of loyal subcontractors, suppliers, and consultants; and perhaps minimal working capital but lots of borrowing potential.

Similarly architects may step out of their design role by buying property, raising money, constructing or renovating buildings, and then selling or leasing them for a profit (or loss). Again, similar to a corporate entrepreneur, the architect can assume the roles of developer and borrower, contractor, marketer, and investor, as well as designer. Nevertheless, each separate role must be played. Each demands certain, distinguishable know-how and action. And each may draw on widely divergent talents or capabilities in the person assuming the roles. Also conflicts of interest can arise in playing multiple roles, such as when architects act as general contractors for their clients—this was once considered unethical by the AIA. Today full disclosure of financial interests by the architect is presumed to mitigate conflicts of interest and satisfy ethical concerns.



Project construction cannot begin until all of the proverbial ducks are in a row. Adequate funds must be ready to flow; property control or ownership must be finalized; architectural and engineering design documents must be completed and approved by all authorities, with building permits in hand; construction contracts must be negotiated and signed; insurance must be in force; preleasing or presales conditions imposed by lenders must be met; and other minor but essential tasks must be finished. Unless all preconstruction necessities are checked off, construction cannot proceed. It is not uncommon to reach the point of commencing construction only to be stopped, sometimes indefinitely, because one of these contingent necessities remains unsatisfied. Architects have drawings in filing cabinet drawers and digital data storage containing completely documented projects that remain unbuilt because financing fell through, zoning changes were denied, title to the property became clouded, or citizen-sponsored lawsuits tied up the developer for years beyond the time when the project was economically feasible.

The construction period can last for months or years, depending on project size and complexity. House remodelings are notorious for taking as long to complete as constructing a new home or office building. Delays can occur because of labor strikes, material and labor shortages, adverse weather, unforeseen subsoil conditions, errors or changes in design, lack of funds, or poor construction planning. Some projects, such as hospitals, college campuses, and transportation facilities, seem to be under construction forever. During construction, the architect's role shifts from design to design clarification and modification, review and approval of shop drawings, periodic observation of the contractor 's work and work progress, attending construction site meetings, occasional meetings with inspectors having jurisdiction over the project, and regular interaction with the client.

Users and the Community

End users rarely have contractual relationships with the major participants in the development process but users are virtual clients for the architect. They are the ultimate consumers of architecture, the community of people who finally see, admire (or dislike), touch, occupy, live in, and move around or through the finished product. Included are neighbors as well as people who visit, shop, work, or reside in buildings. They are the collective constituency for those who design and build. Building codes and zoning regulations protect them, not the architect, owner, contractor, or lenders.

Many users and community citizens care a lot about architecture, about how it looks, functions, and fits in. Abutting property owners are especially concerned about the design of buildings to be constructed next to or near their building. They understandably worry about how new architecture might

adversely affect views, privacy, access to sunlight, and microclimate, as well as local traffic and parking. Some will fret about economic impact and a few about aesthetic style. These concerns go beyond just complying with zoning and building code regulations, seen by citizens as minimum requirements that must be met and for which designers therefore get little credit.

Consequently, responsible architects always take into account the virtual, nonpaying clients sitting invisibly at the conference table whose interests need to be represented and advocated. Neglected users, slighted community citizens, or upset neighbors may seek recourse as if there had been a contract. They can organize protests, generate negative publicity, withhold rent, even file lawsuits that blame the architect as well as the owner and contractor. Do not forget the end user and the general public. It may even be wise at times to include representative users and concerned neighbors at the design conference table.