AIA Michigan Annual Convention
Project Delivery Systems
Soaring Eagle Casino Resort
Mt. Pleasant, Michigan

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Michigan AIA Annual Convention
Project Delivery System notebook index

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Section #2 - Project delivery methods used by planning, design and construction professionals to deliver their products to their clients?

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Section #1 - Introduction to project delivery systems. How seriously does the design-build project delivery system threaten the traditional practice of architecture?

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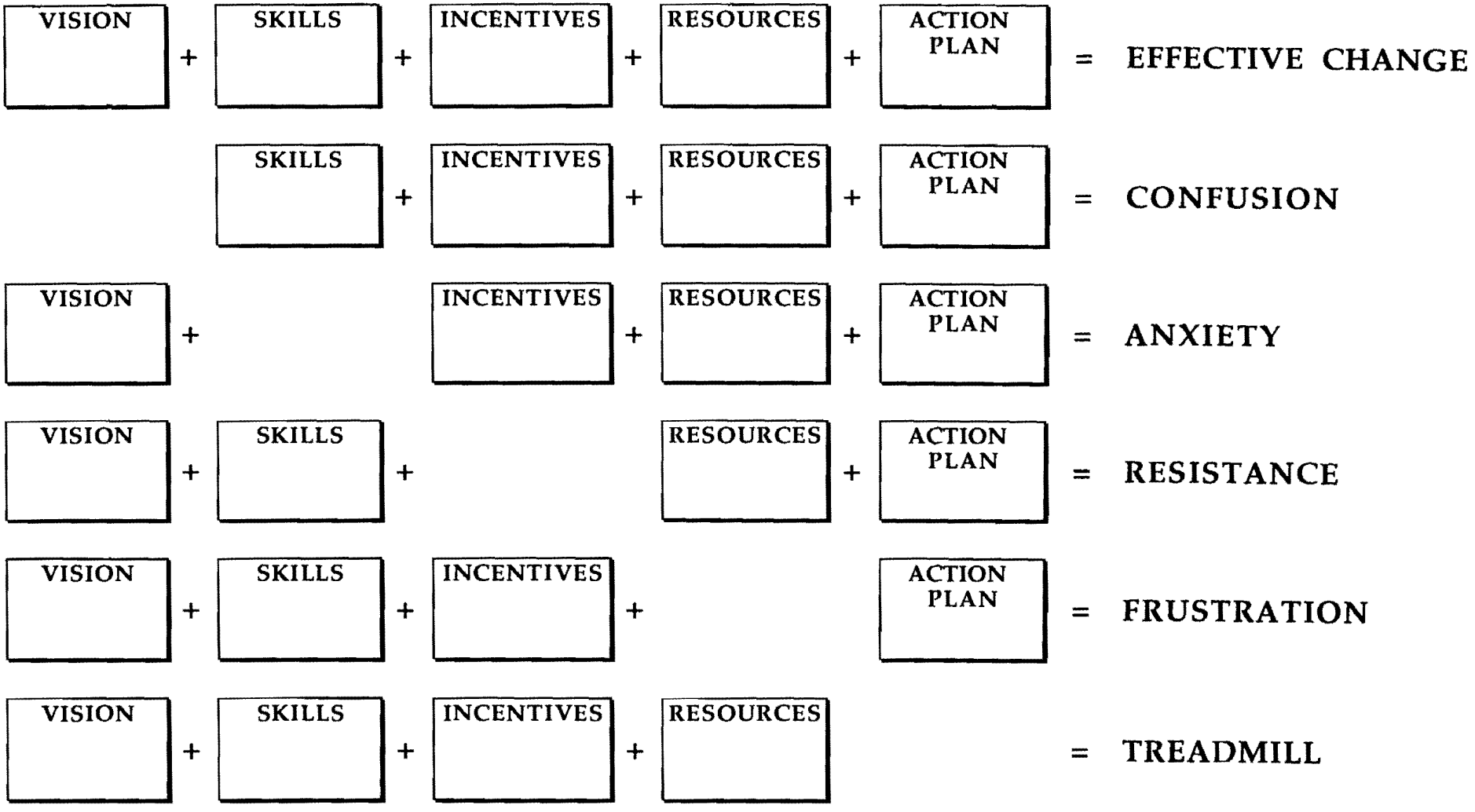
MANAGING COMPLEX CHANGE



Adapted from T. Knoster (1991)

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KEY BUSINESS & PROFIT DEFINITIONS

(1) **Project** - A set of work actions having identifiable objectives, and a beginning and end.

(2) **Profit** - The return in resources obtained by investing other resources in a business or an enterprise. Usually the returned resource has a greater value to the investor than does the invested resource.

(3) **Profitability** - Realizing a profit on one's efforts - an important element of project success.

(4) **Business** - One's occupation, profession or trade.

(5) **Enterprise** - A project that is of above average importance and requires boldness and readiness in its undertaking.

(6) **Project management** - As a business form, project management is a process of improving project profitability.

As a enterprise form, project management is a process of optimizing project profit achieved by a series of effective, well managed actions taken by skilled practitioners.

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38 Elements of importance to success in design and construction - ho 341

- **Summary**

In the design and construction industry there exist many factors which influence the degree of success achieved on a project. They deal with project goals, profit types, project sequencing, the nature of the participants and the kinds of problems most likely to be encountered.

If the parties to a planning, design and construction program recognize the nature and importance of these factors, a major step will have been made toward their proper and effective combination and management.

Below are listed 38 basic influences on project delivery systems. Project management concerns how to combine these into a successful job of which all participants are proud.

- **Six major goals to meet for design & construction project success**

The client, owner & user must be assured upon completion of his job that:

1. The facility program and the facility design have met their needs, desires and wishes.

2. The planning, design and construction work on the project has been accomplished within the time and cost structure required and desired.

3. All relationships on the project have been maintained at a high technical and professional level, and have proven rewarding for those involved and affected.

4. The people involved at all levels of work on the job have realized a financial, professional and technical profit for themselves and their associates by being on the project.

5. The project has been closed out with little or no residual potential for major problems of maintenance or operation.

6. The entire process has been free of unresolved contested claims for additional money, additional time, damage payments, and of the potential for future financial demands after the job has been closed out.

- **Seven types of profit**
  1. **Financial** - an improvement in a money position
  2. **Social** - a gratifying experience contributing to society's well being
  3. **Self actualization** - a gain in personal non financial satisfaction by contributive work
  4. **Value system** - reward gained by application of values in which one believes
  5. **Technical** - acquisition of technical skill or technical data of value
  6. **Enjoyment** - personal enjoyment of a situation gained from involvement in it
  7. **Educational** - learning made possible only by efforts exerted in any given situation

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- Nine major elements in the design & construction sequence & how they are done
  1. **Conceive the basic project**
     Visualize and state the fundamental nature of the proposed project, what purpose it is to serve, and its base characteristics.
  2. **Prepare the program**
     Set down the physical characteristics of the total project in written and graphic form so as to be able to translate these characteristics into approval documents from which the full design can proceed.
  3. **Articulate the program for approval**
     Merge the concept, and the written and graphic program into written and graphic construction language which can be reviewed and released by the ultimate decision makers for full design.
  4. **Approve the basic project**
     Approve the concept, the program, and the merging of the two. This approval by those in authority initiates the full design and construction process
  5. **Design the project**
     Prepare full contract documents for construction use.
  6. **Construct the project**
     Build the project and make it ready for turnover to the owner or user.
  7. **Turn over the project**
     Release the constructed project to the owner or user with full documentation needed to operated and maintain the completed environment.
  8. **Operate the project**
     Take over, run in, and make the new environment fully operational.
  9. **Maintain the project**
     Keep the new environment in proper operating condition by a well conceived and effectively managed maintenance effort.
- Six major participants in the design & construction process
  1. **Conceiver** - The ultimate decision making force behind the entire program
  2. **Translators** - The parties that translate the project concept into construction documents
  3. **Constructors** - Those who build the facility
  4. **Operators** - Those who operate the completed facility
  5. **Regulators** - Those who help assure project adherence to the cause of public good
  6. **Users** - Those who occupy and use the facility for the purpose for which it is intended
- Ten major types of design & construction problems
  1. **Constructive acceleration**
     An action by a party to the contract that forces more work to be done with no time extension, or the same amount of work and a shorter period of time in which to do it.
  2. **Constructive change**
     A construction action or inaction by a party to the contract that has the same effect as a written order.
  3. **Defective or deficient contract documents**
     Contract documents which do not adequately portray the true contract scope.
  4. **Delay**
     A situation, beyond the control and not the fault of a contract party, that causes a delay to the project

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5. **Differing site condition**
   A situation in which the actual conditions at the site of a project differs from those represented on the contract documents, or from reasonable expectations of a site in that area.
6. **Directed change**
   A legitimate change within the contract scope for which the owner is obligated to pay.
7. **Impossibility of performance**
   A situation in which it is impossible to carry out the work within the contract requirements.
8. **Maladministration**
   The interference of one contract party with another contract party's rights, that prevents the latter party from enjoying the benefits of least cost performance within the contract provisions.
9. **Superior knowledge**
   The withholding of knowledge by one party to a contract from another party to the contract during the precontract period, and that, subsequent to contract execution, adversely affects the second party's construction operations in matters of importance.
10. **Termination**
    Dismissal of a party to the project contract for convenience or default.

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LINE OF ACTION

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Elements of the Line of Action

The line of action is a simple statement of the range of tasks necessary to conceive, design, build, and operate and environment. The line begins at a point referred to as the recognition of need with these actions following.

Conceive
Program
Articulate
Approve
Design
Construct
Turnover
Operate
Maintain

These all culminate at an end point called discharge of design and construction responsibility. A brief description of each step is appropriate in understanding their importance to the total project program, design, and build concept.

Recognition of need is the point at which a requirement for a new environment is first felt. The planning, design and construction professional usually is involved in this creative stage since recognition of need is the starting point of the line of action - the entire planning, design and construction activity begins here.

Taking the points in order:

Conceive

During the conceptual period the need, which may be for increased facilities, larger dollar volume, more efficient handling systems or a variety of other demands is visualized and put down in some rough form. It may be a pencil sketch or may remain an idea in someone's mind. Here the project sees its origin and it is this early idea that often carries through the entire project. A good conceptual grasp is essential if the project is to be successfully completed.

Program

In the programming phase, the needs of the concept are put into easily understood tabular form - so many square feet for storage, so many square feet for office, so much floor to ceiling height for shipping facilities, etc. The actual physical demands of the environment are set forth in the project program or project bible.

Articulate

Now the concept and program are combined into preliminary construction language. Floor plans are drawn in accordance with program requirements. The functional arrangement is shown in accordance with the project functional analysis. Materials are called out as the concept requires.

Approve

This is a critical point in the line of action. By now sufficient work has taken place so the manager and the ultimate decision maker can understand the project - can say: "I like this or I don't like it; change this, revise this; let's increase that a bit; let's cut down here": finally saying: "OK, I'm satisfied with this set of ideas showing the concept and the program, and we have the financing and the land - let's move on!" Approval unlocks the full design and construction of the project.

Design

In the design phase, products of the previous four steps are utilized to prepare a set of working drawings and specifications that translate concept into steel, concrete and space.

Construct

Next, the actual environment is built. Construction is the first point where the project end product begins to visibly and tangibly appear.

Turnover

When the facility has been built, it is turned over with appropriate operating manuals to the owner or tenant. Turnover is an important step and when done properly, it insures that a valuable commodity, the completed environment, is properly given to those who must use it.

On the other hand, neglect of good turnover procedures is often the cause of serious callback problems. We certainly wouldn't turn a complex piece of machinery over to an amateur operator and expect he would make it perform 100% right from the start. Neither should we assume that an owner can take a new environment that has just been built for him and immediately operate it at full efficiency. Time should be spent during turnover to explain to the operator and user how this newly-built environment is to function.

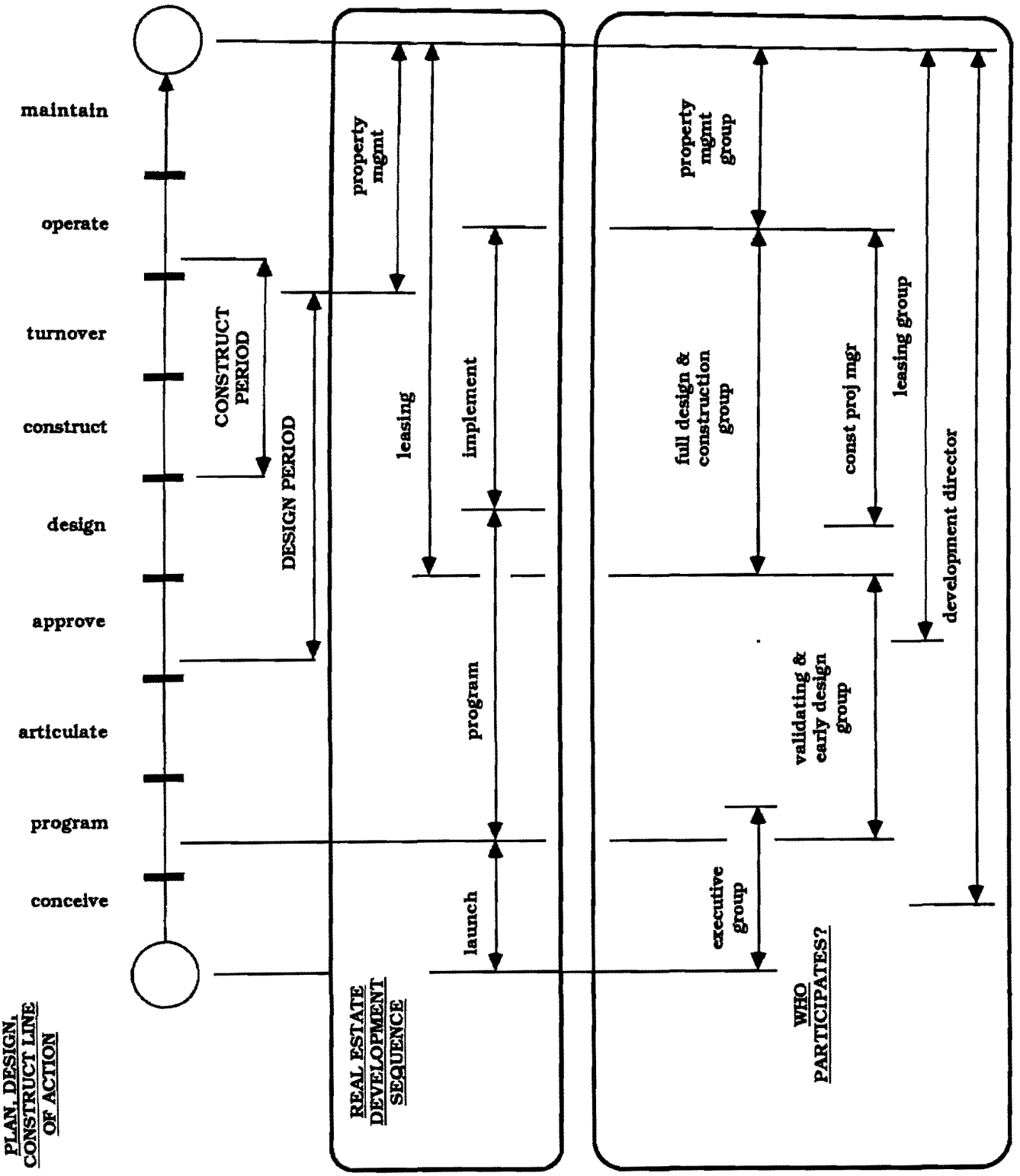
Operate

The facility is now run-in and begins to achieve its full purpose. Operation can be an important responsibility and often the design build contractor will furnish his operational functions in connection with a new environment on a paid contract arrangement.

Maintain

Maintenance of the physical environment is the door opener for future projects for the project team. It is also assures that the environment that has been nursed through the previous eight stages will be maintained correctly so as to work at its best for those who must use it. The maintenance contract is perhaps one of the least explored areas in the more sophisticated approaches to environmental design and construction. It is a profitable business that many contractors are now offering as an additional service.

The end of the line of action is when the programmer, the designer and the builder of environments has discharged his or her responsibilities. In a continuing trustworthy relationship, the line of action will have no end since before a project is finished, the competent professional will be re-involved in another program from its beginning.



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DEVELOPMENT CYCLE ACTIONS & ORGANIZATION

Oct, 1988 - ho321

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Development phases - Ralph J. Stephenson P.E. - ho 336 - d 162

I. Phase A - Launching a project

The launch phase of the work is concerned primarily with locating & nurturing development opportunities or assets intended for long-term ownership and use. If the company's desire is to create negotiable development assets, the launch group works on the front edge of this effort. The launch group may call upon other functional elements of the organization as needed but the launch group must be independently creative, flexible, knowledgeable & understand and enjoy the development process.

The launch group is headed by the chief operating officer of the firm. Upper management members in charge of the other functional elements are members of his launch group. They are charged with locating high potential project opportunities, and screening and profiling them so as to maintain a high percentage of success probability.

The launch group should be relatively unstructured but must maintain a rigorous discipline relative to communication with others in Element A as well as those in their specific area of functional responsibility.

In addition, members of Element A are responsible for maintaining meticulous documentation of opportunities and related action.

II. Phase B - Developing the project program

In the project program work phase the development staff works closely with the launch group to take over the created and profiled opportunity and substantiate its validity, or justify its rejection. The programming group's job is to bridge the gap between the free wheeling creative actions necessary in the launch action and the project implementation action. They often are the cool voice of business reason.

It is critical to understand that the program phase is where development funds are actually committed. These funds are then spent during another phase. Thus projects that emerge from the program analysis must be those with the highest probability of success.

In a sense the program function forces the project to prove itself as a feasible course of action to produce a negotiable development, or a long-term ownership asset.

Where deficiencies are located in a created opportunity, but there appears to be some soundness to the project, the program function is responsible for effecting acceptable changes to the elements that are their responsibility so as to make the project a go!

In this sense the program group must be every bit as creative as is the launch group.

III. Phase C - Implementing the project

During the project implementation period the specific contract documentation is produced and the project is built, leased and occupied. In essence, the majority of the funds commuted to the project during the launch and program phases are actually spent on design and construction during implementation.

Leasing during project implementation is basically rental work taking place that allows tenant improvements to proceed concurrently, sequentially and in harmony with owner work.

The project implementation staff also carries out major remodeling work to existing properties as compared to minor improvements made by the properties staff. Decisions on what is a major & minor project must be arrived at jointly by the functional groups with the aid of the executive staff.

IV. Phase D - Managing improved properties

In the property management phase the development staff exerts management control over improved properties to insure they are successful investments. The property management staff is also responsible for continuous evaluation of each property to determine the best future course of action relative to that property at any given time.

Minor improvements to existing properties in the portfolio are the responsibility of the property management group. Property management determines the scope of work, arrange for the design and construction, and sees that the necessary field work is done.

V. Phase E - Maintaining the ongoing organization

The ongoing organization is an essential supportive staff designed to permit effective functioning of project oriented elements of the organization. It is a relatively high overhead operation built to serve operations.

In a project oriented firm the individual programs or projects drive the company; as such the support or ongoing group must be kept lean but be given all the tools needed to properly buttress line activities.

VI. Phase F - Leasing the asset

Leasing of an asset usually signals the start of income flow which can be used to retire outstanding indebtedness. Many of the actions of the leasing program are accomplished in close cooperation with work accomplished in Elements B, C & D. However, final responsibility for leasing results rests with the leasing department and those charged with its management.

The leasing program usually includes both lease negotiations, and design and construction of the tenant space within the tenant's demised premises.

Tenant design and construction is usually carried out at a different pace than the base or landlord design and construction. For this reason the design and construction of the space may be assigned to a tenant coordinator who acts as the project manager for the tenant space work.

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PARTICIPANTS IN DESIGNING & BUILDING ENVIRONMENTS

There are six basic participants in the process of designing and building environments. These are the conceiver, the translator, the constructor, the user, the operator and the regulator.

Conceivers - Those who conceive the idea and provide the wherewithal to bring the environmental program to a successful conclusion. The conceiver may be the owner but it also might be a governmental agency, a financial source, an architect, an engineer, a contractor, a vendor or a potential tenant looking for space. We identify the conceiver since he usually is the key person driving the project on to completion.

Translators - Those who translate the environmental program into construction language. Traditionally we think of the architect/engineer as the translator. However careful consideration of this matter shows there are many others who translate the conceiver's fundamental ideas into understandable, workable construction language. Subcontractors, suppliers, vendors, manufacturers, contractors and the conceiver may all play a role in translating.

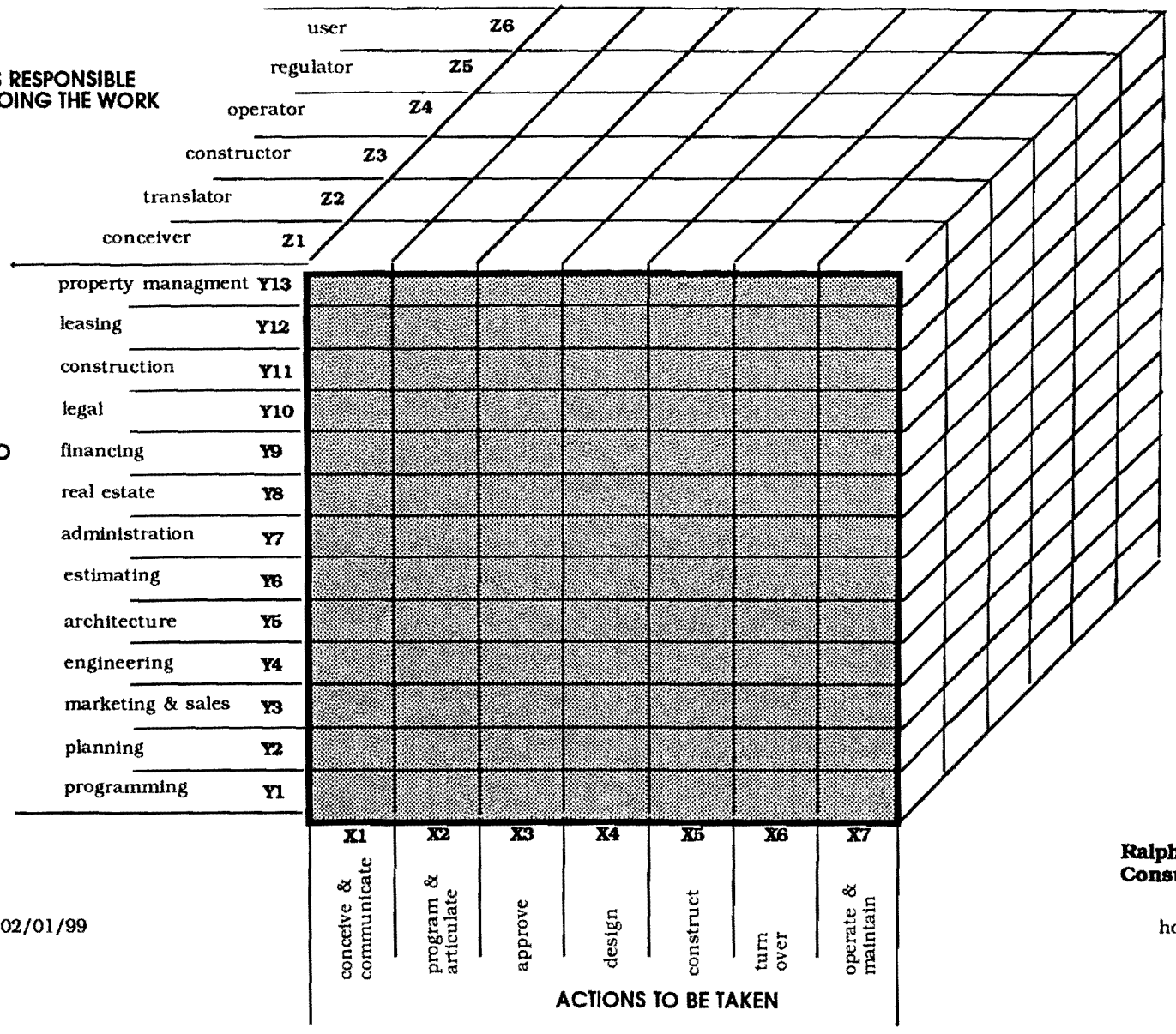
Constructors - Those who interpret the construction language and convert it to a actual physical environment. Occupying this role are general contractors, specialty contractors, vendors, suppliers, manufacturers, artists and others who actually put the materials into place in the field.

Users - Those who occupy and use the completed facility to conduct their work, their recreation, their domestic living, or other activities for which the facility was specifically designed and built.

Operators - Those who operate and maintain the completed physical environment on a continuing basis. Usually the party responsible for this function is an owner or tenant working through a plant or facilities manager.

Regulators - Those who fill a review & inspection position to help insure protection of the health, safety & welfare of the people. This is usually done by enforcing regulations written and adopted by qualified public or private bodies. Examples of regulators include those who work for building departments, departments of natural resources, public health agencies, fire prevention organizations, technical societies and other such groups.

FIGURE 1
MACRO MATRIX BOUNDARIES OF DESIGN AND CONSTRUCTION



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I. **What is needed to move into design and build?**

I. **Functional needs to be filled.**

A. Sales
B. Engineering
C. Architecture
D. Estimating
E. Real estate
F. Finance
G. Legal
H. Graphics
I. Construction
J. Maintenance

All these functions must be filled in a total design build operation irrespective of size of project or size of firm, all are necessary.

II. **What talents are required to move into design and build.**

A. **Sales**

1. Prospects must be located and screened early.
2. Must avoid pure competitive price bidding (single value competition)
3. Salesmen must know design build business thoroughly.
4. Salesmen must know how to use technical assistance, and technical assistance must be available throughout sales period.
5. Good judgment required of salesmen to avoid misuse of material and assistance submitted to clients.
6. Good presentation techniques essential.

B. **Technical**

1. Must have competent engineering and architectural capabilities or sources available currently.
2. Should have real estate know-how and available real estate services and advice.
3. Should know financing techniques; detail knowledge not essential but helpful.
4. Must have construction staff sympathetic to systems design and other design-build concepts. Technical staff must, in turn, be sympathetic towards construction and understand how design and construction fit together.
5. Must have good estimators capable of translating concepts into costs and costs into design documents for construction.
6. Organization must be mobile with interchangeable talents.

7. Graphic and writing talents should be available, preferably on internal staff.
8. Should have good legal advice source currently available.
9. Should have good cost accounting system well related to construction operation.

C. **Administrative**

1. Good grasp of a multitude of business techniques essential.
2. Executives must understand and be sympathetic to sales, design, construction, and the total service concept.
3. Administrators should know real estate and financing elements of environmental construction.
4. Executives must have a grasp of selling construction to laymen. A design build firm often deals with persons unfamiliar with design and construction.

D. **Construction capacity**

1. Must know how to manage construction.
2. Must have good buying abilities (not sharp or shopping oriented, but good)
3. Superintendents should strive for good project liaison and understand the importance of continuing sales on the job.
4. Must minimize callbacks by doing a good job initially. Single responsibility pattern makes it imperative that you as a design firm complete the work so it performs well.
5. All field and office personnel must be sympathetic and understand the design-build concept.

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I. Finding and selling to design-build prospects.

I. Definitions

A. Phase one selling - Activities aimed at locating prospects and generating general knowledge about them prior to specific projects being available. Includes informing the prospect about you.

B. Phase two selling - Activities geared to proposing and obtaining specific project commissions from prospects.

C. Profiling - A selective, flexible, dynamic. operable system of screening prospects and projects for optimum results in phase one and phase two selling.

II. Phase one selling techniques

A. Phone calls

1. Should, if appropriate and possible, lead to a personal visit.
2. Use phone to open doors that lead to personal visits with legitimate and likely prospects.
3. Phone calls should usually result in a decision, recommendation or job award.

B. Correspondence

1. Use project correspondence as a basic tool, not as a casual communication medium. Reading time is at a premium.
2. Follow decision phone calls by confirming letter to avoid later misunderstanding.

C. Personal visits

1. Keep visits short and valuable to prospect. Always ask "How am I helping the prospect do his job better?"
2. Show graphic material about your company.
3. Show examples of your work.
4. Stress single responsibility pattern.
5. Answer questions accurately, honestly, briefly. Don't dally; a prospect's time is valuable.
6. Leave something interesting and useful with the prospect.
7. See all the decision makers possible when you visit the prospect, but start with the top man or woman.

D. Use of your staff

1. Where prospect is good (likely to build), utilize useful staff talents in phase one selling visits.
2. Brief staff members before such meetings.
3. Have a good reason for staff members to accompany you when visiting prospect.

4. Introduce staff members fully to the prospect. Make certain he understands who they are and how they relate to him.
5. Remember the importance of generating confidence. Make certain staff members accompanying you understand this.

III. **Phase one profiling**

A. Financial report analysis
B. Response mailing
C. Control point use
   1. Available industrial parks
   2. Available financing
   3. Available tenants
   4. Available land
   5. Available services
D. Prospect financial strength analysis
E. Prospect growth analysis
F. Prospect SIC classification

IV. **Phase two selling techniques (When proposing on a specific project)**

A. Proper determination of scope of work is essential. If project outline specification is available, take advantage of it. You may have a ready-made scope of work immediately.
B. As you determine project characteristics with prospect, be specific, and make him be explicit.
C. Visit the project location and make a site and area evaluation.
D. Obtain local codes and ordinances.
E. Learn all about any competition you have or might have.
F. Do not indiscriminately give away information that might be used against you to generate single value competition.
G. If you can't collect proper data about the project because of lack of time, experience or knowledge, get someone on the job who can.
H. Make certain the prospect knows you are collecting information This is one direct method of showing how competent you really are, particularly if it is your first technical contact with the project.
I. Keep prospect generally notified of your progress.
J. Sell the prospect's entire decision-making organization throughout the Phase two period - you are getting close to a contract.
K. Find all control points that give you unique advantages; these may include financing, land, or others.
L. Use graphic aids for Phase two selling, and use them continually. Such helps as network plans, decision tables, curves, charts, anything the owner or

prospect can understand quickly and use himself will be of value to you and him.

M. Personally present your proposal to the prospect decision-makers.
N. Know the project.

V. **Phase two profiling**

A. Project type
B. Project size
C. Project cost
D. Project location
E. Your current work load
F. Management objectives of you and your prospect.
G. History of success in similar projects
H. Current chances of getting project
I. Type of contract possible

VI. **Remember**

A. The prospect must ultimately trust somebody, MAKE IT YOU, NOW.
B. Mutual confidence and trust - the prospect's in you and yours in the prospect - is the best protection you have against him shopping your sales and contract information.

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SUGGESTIONS ON SELLING TO DESIGN/BUILD CLIENTS

During a seminar several years ago, Dr. Harvey Thomas, a behavioral psychologist, outlined several suggestions as to how the designer/builder could best cope with customer motivation and pricing problems. The words of advice from Dr. Thomas are excellent, and are reproduced below for consideration in generic (G) construction sales situations where motivation and pricing are potential problems.

To Increase Customer Motivation:

1. Give the prospect or customer a role to play.

2. Make intangible benefits you are offering, real.

3. Eliminate or minimize distractions to your discussions.

4. Emphasize the advantages of what you are offering.

5. Allow catharsis of the prospect or customer's fears.

6. Stimulate the prospect or customer's discontent with anything less than what you are offering.

To Deal with Pricing Problems:

1. Investigate possible smokescreens.

2. Use sandwich technique (i.e. advantages vs. disadvantages).

3. Broaden the customer's perspective to all advantages of your suggestions.

4. Match his or her needs against your offering and its advantages.

5. Examine costs - item by item. Don't hesitate to show your pricing work sheets.

6. Don't negotiate on the basis of generosity.

7. Create favorable illusions (i.e., give the prospect or customer a throwaway if appropriate).

8. Give the prospect or customer a less attractive choice.

9. Overstate the prospect or customer's objections.

10. Explore the cost of a bad decision or no decision.

Each point above should be examined and reviewed in detail. As quick reminders, they serve to emphasize the need to always be aware of what it is your prospects and customers require. Make sure you understand what motivates them; then always indicate and convey your desire to work with them to achieve the things that can be best obtained from you and you alone.

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Basic tools for successful project management - ho 507

Project managers have several fundamental management tools with which they can effectively implement a project action plan, and build a well-functioning team. These include:

- Actions to be taken
- Concepts to effect change
- Functions
- Interrelations - organizational structure
- Participant resources
- People behavior
- Performance measurement
- Planning & scheduling systems
- Thinking processes

Project management tools such as the above are usually very complex: They must be skillfully applied by the project team to be effective. Thus the leader of the project, the project manager, should be well versed in what these tools are, how they are best used, and what they are designed to help accomplish.

Excellent project managers realize that the list is merely a good starting point on which to build a usable project management approach. Each individual should determine what goes into their tool box, and then fill it with those implements that best suit that individual's talents, abilities and needs.

I. • **Actions to be taken**
   - A. Conceive
   - B. Program
   - C. Translate
   - D. Approve
   - E. Design
   - F. Construct
   - G. Turn over
   - H. Operate

II. • **Concepts to effect change**
   - A. Vision
   - B. Skills
   - C. Incentives
   - D. Resources
   - E. Action plan

III. • **Functions**
   - A. Planning
   - B. Organizing
   - C. Staffing
   - D. Directing
   - E. Controlling
   - F. Representing

IV. • **Interrelations - organizational structure**
   - A. Formal functional
   - B. Informal functional
   - C. Reporting
   - D. Staff
   - E. Temporary

V. • **Participant resources**
   - A. Conceiver
   - B. Translator

C. Constructor
D. User
E. Operator
F. Regulator

VI. • **People behavior**
A. Motivation
B. Hygiene
C. Learning
D. Value systems
E. Personal goals & objectives
F. Personal growth
G. Social relatedness

VII. • **Performance measurement**
A. Measurement units
B. Performance standards

VIII. • **Planning and scheduling systems**
A. Network modeling
1. Arrow diagraming
2. Classic precedence system
3. Modified precedence system
B. Bar or Gantt chart
1. Non scalar - not time scaled
2. Scalar - time scaled
C. Slant charts
D. Narrative schedules
E. Project data arrays
F. Money flow curves

IX. • **Thinking processes**
A. Plan
B. Translate
C. Control
D. Correct
E. Learn

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Five ingredients of significance

The basis of a talk on October 9, 1991 to the
Grand Rapids, Michigan chapter of the
American Society of Professional Estimators

Five ingredients are critical to good thinking and effective management in design and construction.

- Importance!
- Responsibility!
- Excitement!
- Contribution!
- Methodology!

Properly proportioned, blended, and applied, they bring important rewards to skilled practitioners who plan, design, construct, and operate our society's buildings and facilities.

These rewards enrich professional life, and are won as we become aware of how the five act in our daily work.

First, let's examine - *Importance*

1. IMPORTANCE!

The design and construction professional contributes greatly to the quality of our total environment. This contribution of knowledge, skill, ingenuity, ethical behavior, and moral outlook makes the construction practitioner a front line battler for good. It identifies the construction professional as being an important individual. It makes the organization for which the construction professional works a significant vehicle for societal good.

We in the construction industry must think of our efforts as contributing to society's good without our worrying overmuch about who gets the credit or recognition for what is accomplished. Doing this makes you important to others.

The second point of consideration is - *Responsibility*

2, RESPONSIBILITY!

Responsibility for our actions as professionals is an integral part of our duties. We cannot always be 100% right. We can however, improve the probability of being accurate to a degree where the public, our employers, our clients, and our peers may safely place high confidence in our judgment.

This confidence should generate a shared understanding that we will take responsibility for our actions and their results.

In the work place, some may have a flawed perception of what constitutes a mistake by the skilled professional. This is a risk all professionals must take. We cannot transfer that risk to those who are not so fortunate or knowledgeable, nor as able to carry the burden of such risk.

Your decisions as to how to carry responsibility are part of your professional thinking. They are developed by your upbringing, your work, your training, your education, and your experiences. The true professional must accept the risk of responsible action by being honestly responsible.

Feeling responsible for a job is often as great a reward as is feeling you have contributed to that job's success

Taking the risk of being responsible generates the next reward element of our business life - *Excitement*

3. Excitement!

To chase truth in things technical is natural instinct of the true construction professional. Excitement is one of the rewards of successful construction - a business where the product is of critical importance, and its design and manufacture is in your hands.

Excitement is the process of experiencing the ups and downs that accompany any contribution to society's well being. It is the barometer that measures the pressure, or lack of pressure to do well.

The reward of excitement is frequently found in both the action and the result. When we are about to accomplish something significant, excitement mounts.

When we have accomplished something significant, excitement is heightened by what the accomplishment means to those for whom we took the action.

Excitement must be one of the driving forces for a professional who desires excellence. However, the project must be worthy of that excitement and the participants must be willing to join in. This leads to our next significant ingredient - *Contribution*

4. Contribution!

If you don't care who gets the credit you can accomplish anything.

Believing this brings into view a vast array of rewards and benefits to the professional practitioner. Credit is a tool to encourage improvement and learning. If you are a real pro at what you do, and you want the results of your work to bring about truly constructive change, then by contributing and transferring credit you can often gain rewards far beyond a direct credit benefit to you!

When you contribute what you can without concern for being given credit, you gain benefits that encourage you and those being given the credit, to become even better.

Interestingly, a direct gain for another by your efforts, usually results in a gain for you, often from unidentifiable sources. Many times this unexpected bonus comes from those who have been credited and their supporters.

Even if the rewards of giving don't result in a credit to you, don't worry - your store of gifts for others won't ever run out. Giving encourages giving.

The rewards of accomplishing important things, accepting responsibility, experiencing excitement, and making a contribution of talents without expectation of credit, bring into view a fifth ingredient of significance - *Methodology*

5. Methodology!

Often the secret of doing anything well is first doing it poorly - knowing some degree of failure. We must all experience failure to understand what success means. Patterns of success seen through the traps of failure help us develop better methods of doing things.

These are then merged into habits and processes that encourage the elements of successful action to be continually duplicated and evaluated, and when necessary, changed or discarded.

Every exceptional professional has built a variety of procedures that serve well and hold failure at bay. The reward of using these procedures is the gift of success.

When you have learned to use good procedures well, when not to use them, and when to adapt them to a different situation, you will have built a dependable professional methodology.

Successful practitioners must use good methods to guide them in matters of significance.

AIA Michigan Annual Convention
Project Delivery Systems
Soaring Eagle Casino Resort
Mt. Pleasant, Michigan

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Section #2 - Project delivery methods used by planning, design and construction professionals to deliver their products to their clients?

2.01	On correct language (531)
2.02	Traditional Project Delivery Systems (291)
2.03	Nontraditional Project Delivery Systems (292)
2.04	Professional service contract characteristics(362)
2,05	Construction contract characteristics (361)
2.06 & 2.07	Various project delivery systems by which architects deliver their product? (537)
2.08	Design/build matrix (358)
2.09 to 2.12	Detailed development network model (344)

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ON CORRECT LANGUAGE

"If language is not correct, what is said is not what is meant: What ought to be done remains undone: Morals deteriorate: Justice will go astray: And the people will stand about in hopeless confusion."
(quote from Confucius)

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TRADITIONAL PROJECT DELIVERY SYSTEM CHARACTERISTICS

1. Checks and balances normally built in from start

2. Construction decisions usually based on capital costs

3. Participant selection often made by cost competitive bidding

4. Job control is highly centralized in most stages

5. Project usually being built for owner/users

6. Contract documents completed before bidding

7. Bidders selected from short list derived from long list (occasionally use long list)

8. Bonding is often required

9. Site preparation and expense work often by owner before construction starts

Note - Expense work includes those costs that do not directly increase life or value of the facility.

10. Majority of attention given to the need and want list. Wish list usually considered a luxury.

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NON TRADITIONAL PROJECT DELIVERY SYSTEM CHARACTERISTICS

1. Checks and balances evolve as project proceeds and when need arises.

2. Construction decisions based on capital costs, maintenance costs, operating costs, project quality desired, and desired investment return.

3. Lead participant selection made on professional and technical abilities, and on reputation and past performance, along with estimated project cost.

4. Job control somewhat decentralized during early program and design stages with progressive centralization as the working document and construction phases are approached.

5. Project could be for a variety of conceivers and prime movers including owners, users, investors, developers, funds, syndicates, governmental agencies (privatisation), and groups assembling capital to gain desired returns on investment.

6. Construction is often closely dovetailed with design of the project. Design usually proceeds with construction guidance, and advice from a construction discipline.

7. Capital cost is often negotiated from the pro forma base and reduced in stages to a guaranteed maximum price (gmp).

8. Need for bonding is usually minimized or eliminated by careful selection procedures to maximize probability of success.

9. Site preparation and expense work often done by various members of the selected project or program team.

10. Design and construction is heavily influenced by consideration of the needs, wants and wishes of the participants.

2. Professional Service Contract Characteristics

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A. Agreement premises

1. Totally negotiated - broad multivalue competition
2. Partially qualified - moderate multivalue competition
3. Totally qualified - narrow multivalue value competition

B. Authority limits

1. As agent
2. As limited agent
3. As contractor

C. Payment methods

1. Fixed total including payroll + overhead + profit + (expenses)
   a. Expenses included
   b. Expenses separate
2. (Payroll costs) x multiplier + fixed fee + expenses
   a. Limit on
   1.) Payroll hours
   2.) Expenses
   b. No limit on
   1.) Payroll hours
   2.) Expenses
3. (Payroll costs) x multiplier for payroll costs & overhead
   a. Expenses included
   b. Expenses separate
4. % of total construction cost
   a. Expenses included
   b. Expenses separate

D. Scope of services

1. Single responsibility
   a. All in house
   b. In house & outside consultants
2. Split responsibility
   a. In house, client & other prime consultants
   b. In house & other prime consultants
   c. In house & client

ho 362 Jan, 90

3. Construction Contract Characteristics

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A. Agreement premises
1. Totally negotiated - broad multivalue competition
2. Partially qualified - moderate multivalue competition
3. Totally qualified - narrow multi valuevalue competition

B. Authority limits
1. As full agent
2. As limited agent
3. As contractor

C. Payment methods
1. Fixed cost (hard money)
2. Time & material + fixed fee
   a. Limit on
      1.) Time & material (gmp) with no shared savings
      2.) Time & material (gmp) with shared savings
   b. No limit on time & material
3. Time & material + % fee
   a. Limit on
      1.) Time & material (gmp) with no shared savings
      2.) Time & material (gmp) with shared savings
   b. No limit on time & material
4. Conditional payments or penalties
   a. Incentive/disincentive
   b. Liquidated damages

D. Scope of services
1. Single responsibility - in house & subcontractors
   a. All trades
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials
   b. Limited trades
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials
2. Split responsibility - in house, subcontractors & other primes
   a. All trades in contract
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials
   b. Limited trades in contract
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials

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Various project delivery systems by which architects deliver their professional product?

I. **By simple characteristics such as:**
   A. Traditional
   B. Non traditional
   C. Fast track
   D. Design and build
   E. Master builder
   F. and other of these general characteristics

II. **By primary methods - see Appendix A - page 191, Project Management for Building Designers and Owners - by Howard Birnberg - Association of Project Managers, CRC Press**
   A. Traditional straight-line
   B. Fast-track
   C. Design-build

III. **By end product**
   A. A set of documents which define the scope of the job to be built.
   B. The management skills by which the gap is bridged between the scope definition and the physical product to be built from the contract documents.
   C. The financial resources by which the gap is bridged between the scope definition and the physical product to be built from the contract documents.
   D. The physical product to be built from the contract documents.

IV. **By name description - see pages 44, 45, 46, 47 & 48 in Architectural Practice - Robert Gutman - Princeton Architectural Press)**
   A. Planning
   B. Designing
   C. Constructing
   D. Design and build
   E. Design and develop
   F. Design and construct
   G. Development

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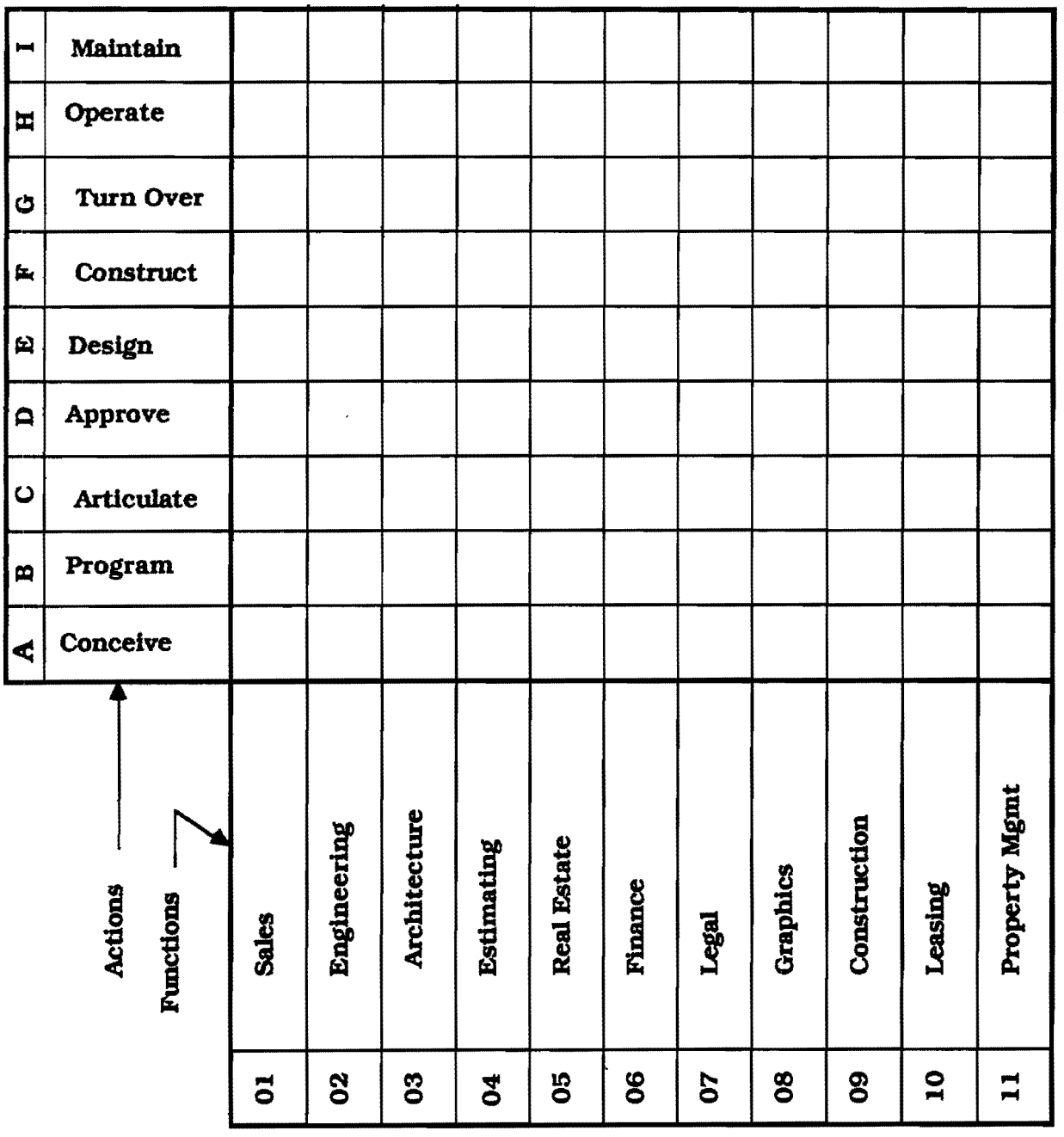
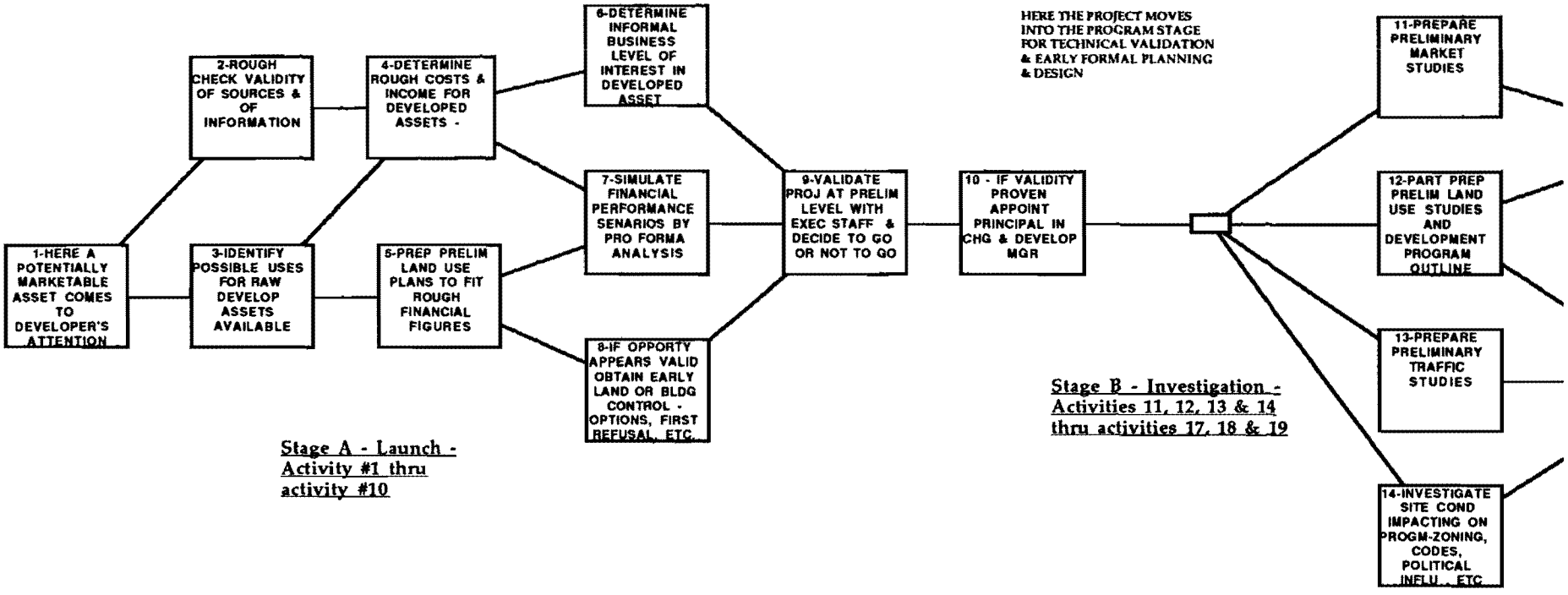
V. **By organizational characteristics of the firm doing the work - see Managing Architectural Projects - The Process - The American Institute of Architects - David Dehaviland**
   A. The generalist organization - pages 7 through 12
   B. The studio organization - pages 9 through 12
   C. The department organization - pages 9 through 12
   D. The matrix organization - pages 9 through 12

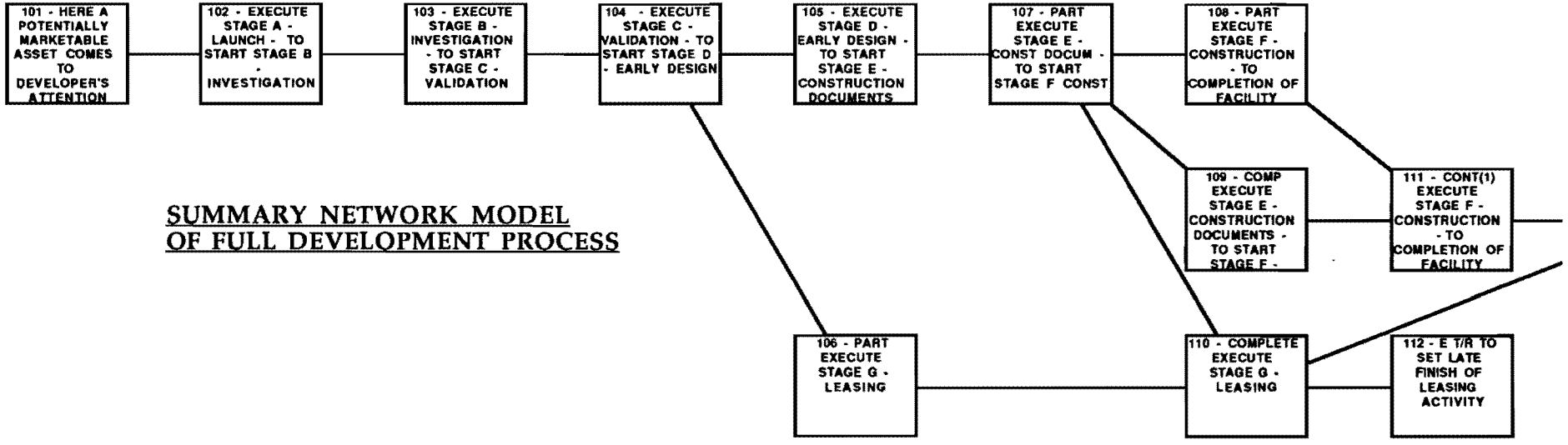
VI. **By classification in which the elements of a project delivery system are defined in relation to the other elements - the basic elements of the classification system are:**
   A. Agreement premises
   B. Authority limits
   C. Payment methods
   D. Scope of services

Ralph J. Stephenson PE

DESIGN/BUILD MATRIX

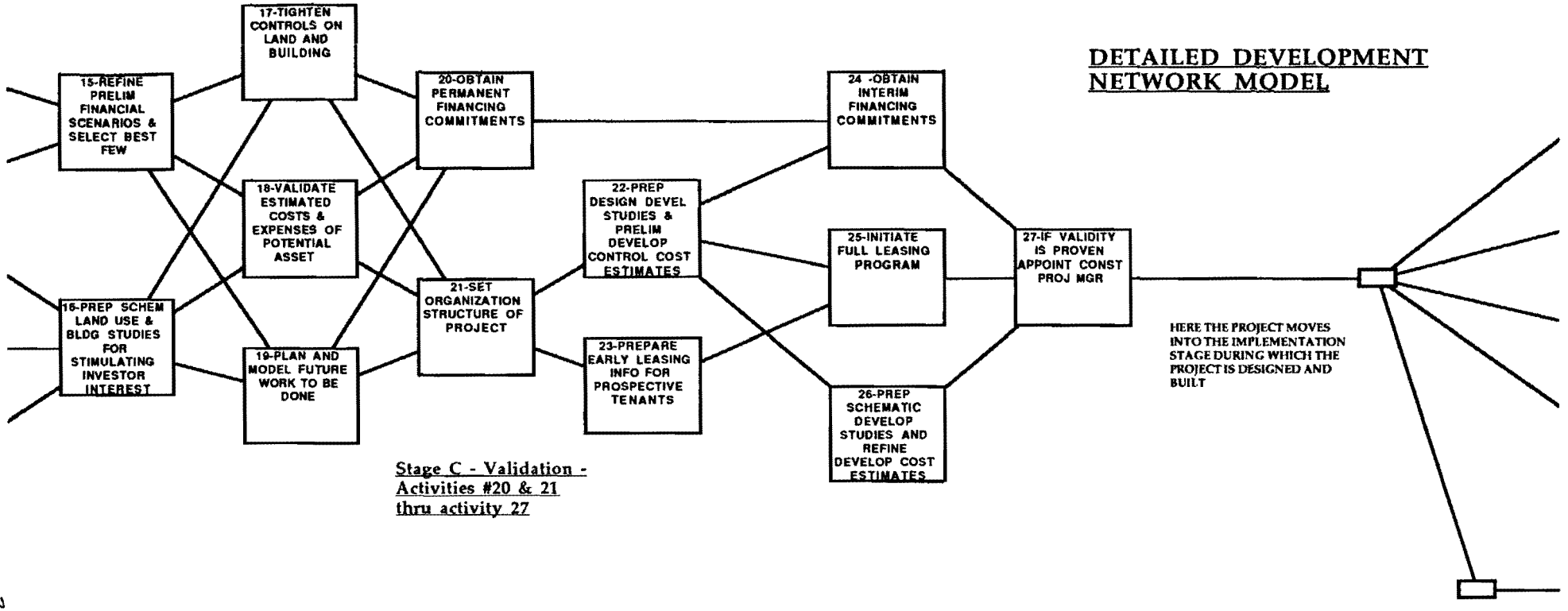






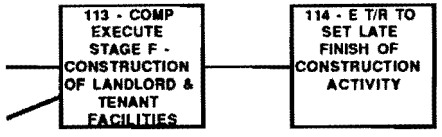
SUMMARY NETWORK MODEL OF FULL DEVELOPMENT PROCESS

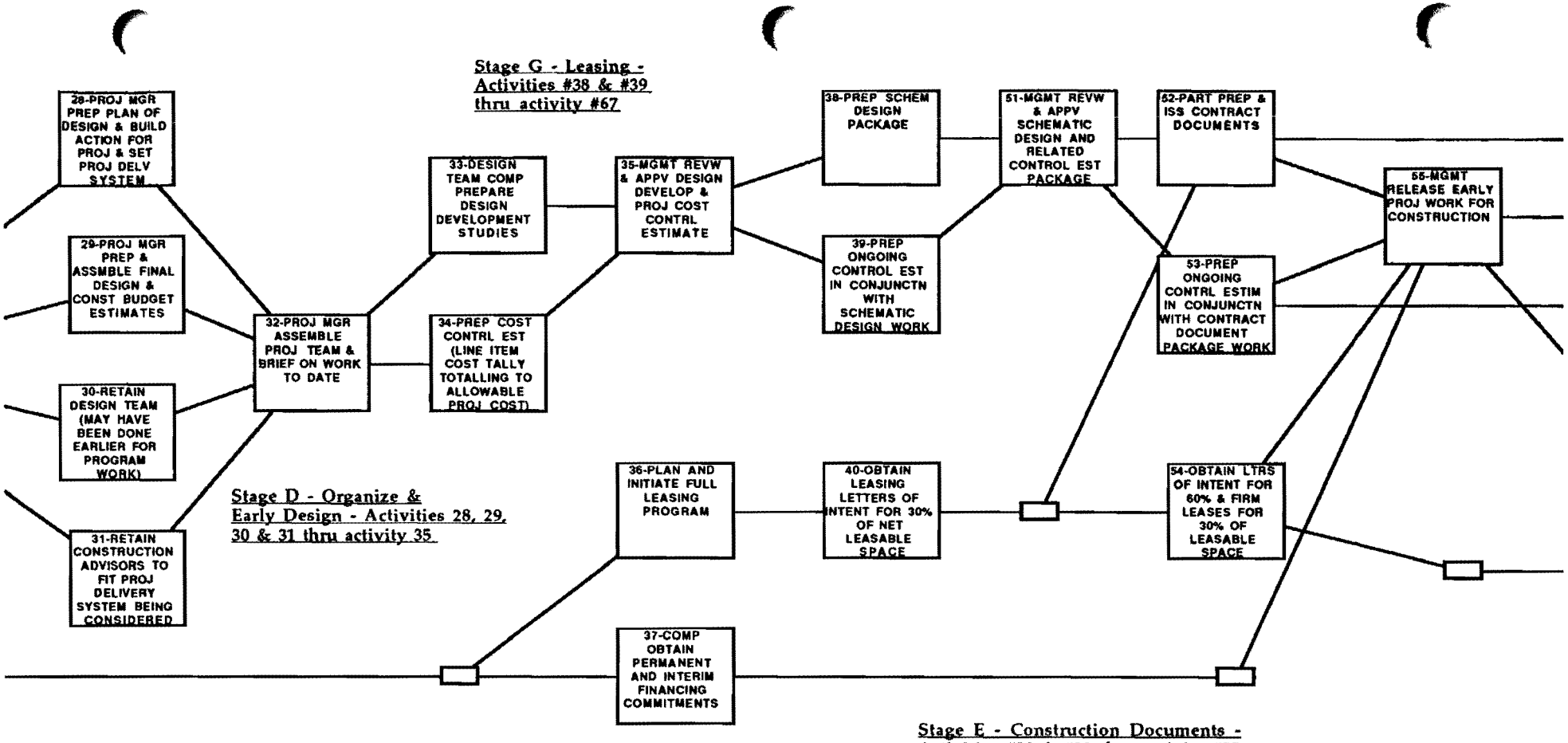
DETAILED DEVELOPMENT NETWORK MODEL



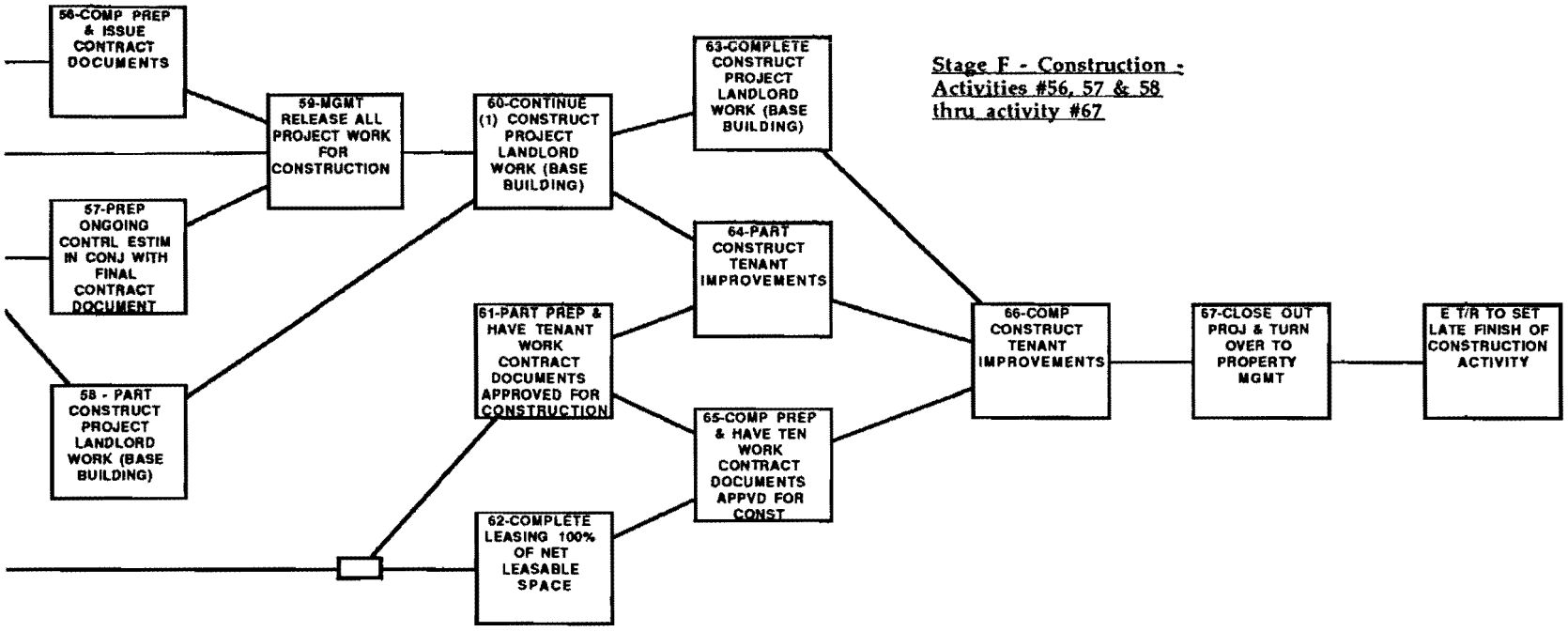
Stage C - Validation - Activities #20 & 21 thru activity 27

2.10




Stage G - Leasing - Activities #38 & #39 thru activity #67
28-PROJ MGR PREP PLAN OF DESIGN & BUILD ACTION FOR PROJ & SET PROJ DELV SYSTEM
29-PROJ MGR PREP & ASSMBLE FINAL DESIGN & CONST BUDGET ESTIMATES
30-RETAIN DESIGN TEAM (MAY HAVE BEEN DONE EARLIER FOR PROGRAM WORK)
31-RETAIN CONSTRUCTION ADVISORS TO FIT PROJ DELIVERY SYSTEM BEING CONSIDERED
32-PROJ MGR ASSEMBLE PROJ TEAM & BRIEF ON WORK TO DATE
33-DESIGN TEAM COMP PREPARE DESIGN DEVELOPMENT STUDIES
34-PREP COST CONTRL EST (LINE ITEM COST TALLY TOTALLING TO ALLOWABLE PROJ COST)
35-MGMT REVW & APPV DESIGN DEVELOP & PROJ COST CONTRL ESTIMATE
Stage D - Organize & Early Design - Activities 28, 29, 30 & 31 thru activity 35
36-PLAN AND INITIATE FULL LEASING PROGRAM
37-COMP OBTAIN PERMANENT AND INTERIM FINANCING COMMITMENTS
38-PREP SCHEM DESIGN PACKAGE
39-PREP ONGOING CONTROL EST IN CONJUNCTN WITH SCHEMATIC DESIGN WORK
40-OBTAIN LEASING LETTERS OF INTENT FOR 30% OF NET LEASABLE SPACE
51-MGMT REVW & APPV SCHEMATIC DESIGN AND RELATED CONTROL EST PACKAGE
52-PART PREP & ISS CONTRACT DOCUMENTS
53-PREP ONGOING CONTRL ESTIM IN CONJUNCTN WITH CONTRACT DOCUMENT PACKAGE WORK
54-OBTAIN LTRS OF INTENT FOR 60% & FIRM LEASES FOR 30% OF LEASABLE SPACE
55-MGMT RELEASE EARLY PROJ WORK FOR CONSTRUCTION
Stage E - Construction Documents - Activities #38 & #39 thru activity #55

2.11



Stage F - Construction - Activities #56, 57 & 58 thru activity #67

EARLY START DURATION EARLY FINISH

128 - FILE FOR VARIANCE ON CROSS ACCESS AGREEMENT (1, 5) - 10

- ACTIVITY NUMBER
- ACTIVITY DESCRIPTION
- THOSE RESPONSIBLE ( )
- ACTIVITY DURATION IN ESTIMATED ELAPSED WORKING DAYS

LATE START LATE FINISH

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DEVELOPMENT PROCESS FLOW CHART

RESERVED ACTIVITY NUMBERS

41	46
42	47
43	48
44	49
45	50

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SHEET #D-1

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Section #3 - Information about project delivery systems that might help the design and construction professional be successful in their work

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Summary of the Nine Master Keys of Management

(Adapted from the Nine Master Keys of Management by Lester R Bittel)

Three Requirements of the Good Manager

A. Acquire a discerning (unique) point of view.
B. Follow an effective mode of action.
C. Employ a sensitive touch in interpersonal relationships.

A Discerning Point of View

Action #1 - Apply situational thinking	Result #1 - Your decisions will be more objective and less impulsive.
Action #2 - Identify vital targets	Result #1 - You'll quickly recognize turning points in critical situations.
Action #3 - Prepare for the probable	Result #3 - You'll be less flappable in difficult situations.

An Effective Mode of Action

Action #4 - Focus on performance criteria	Result #4 - You'll better satisfy yourself and your superiors.
Action #5 - Act form a plan	Result #5 - You'll be able to get projects under way quickly and with certainty.
Action #6 - Manage by Exception	Result #6 - You'll accomplish more work than you ever thought possible.

A Feeling for People

Action #7 - Develop your confidence in others	Result #7 - You'll find that people cooperate more freely.
Action #8 - Employ the power of training	Result #8 - You'll find that employee attitudes improve.
Action #9 - Know your true self	Result #9 - When you truly comprehend your whole self you'll find people responding to your ideas more directly and often more favorably.

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Questions to be asked

1)	**What?**	--	What is the scope of the activity?
		--	What is the standard of performance?
		--	What are our objectives?
		--	What are our goals?
		--	What is needed to start?
2)	**Where?**	--	Where will the work take place?
3)	**When?**	--	When does the work start?
		--	When is the work supposed to finish?
		--	When will the work be completed?
4)	**How?**	--	How do I know when the job is done?
		--	How do I know if we've done a good job?
		--	How do I get out of the job when it is done?
5)	**Who's?**	--	Who's responsible?
		--	Who's in charge?
		--	Who's doing the work?
		--	Who's liable?
		--	Who's in charge for my client?
		--	Who's the ultimate decision maker? (UDM)

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THE NEED FOR PROFIT

A. KINDS OF PROFIT

1. Financial
2. Social
3. Self actualization
4. Value system
5. Technical
6. Enjoyment
7. Educational

B. ELEMENTS OF MULTI VALUE COMPETITION

1. Competence
2. Service
3. Integrity
4. Cost
5. Delivery
6. Understanding

C. HOW DO WE ACHIEVE PROFIT - TRUE PROFIT ?

1. Be smarter
2. Plan better
3. Control closer
4. Achieve more

& profits will be automatic!

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CONSULTING ENGINEER

SALES/PROFITS ANALYSIS

Combinations Possible

Sales Up Profits Up	Built new plant(s) recently
Sales Up Profits Down	Remodeled existing plant(s) recently
	Acquired existing plant(s) from others recently
Sales Down Profits Down	Sold existing plant(s) of theirs recently
Sales Down Profits Up	Have not built new plant(s) or remodeled recently

Apply on Business Unit Basis

Sales Up / Profits Up

1. May stabilize - no new construction
2. Probably diversify - business acquisition
3. May thrust into traditionally popular market - expand plant
4. May construct luxury facilities
5. May acquire balance businesses

→ Definitely interested in new construction (new potential)

Sales Up / Profits Down

1. Will seek to lower production costs
2. Will thin existing product line
3. May add acquired product lines proven successful
4. Will re-examine internal policies

→ Probably not interested in new construction but in rehabilitation of old facilities (Gradual potential)

DB
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SALES/PROFITS ANALYSIS
(Continued)

Sales Down
Profits Down

1. Will seek to improve marketing procedures
2. Will seek product diversification
3. Will thin existing product line
4. May add acquired product line proven successful (doubtful)
5. Will totally re-examine internal policies

Probably not interested in new construction now but will be very shortly or out of business (explosive potential)

Sales Down
Profits Up

1. Will diversify product line
2. Will strengthen sales program
3. Will maintain present status on facilities (temporary)
4. Will acquire balance businesses
5. Will actively plan expansion

Probably no new construction now but need will pressure additional facilities in moderate future (near future potential)

DB
1/28/72 H/O 85

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SUGGESTIONS ON SELLING TO DESIGN/BUILD CLIENTS

During a seminar several years ago, Dr. Harvey Thomas, a behavioral psychologist, outlined several suggestions as to how the designer/builder could best cope with customer motivation and pricing problems. The words of advice from Dr. Thomas are excellent, and are reproduced below for consideration in generic (G) construction sales situations where motivation and pricing are potential problems.

To Increase Customer Motivation:

1. Give the prospect or customer a role to play.

2. Make intangible benefits you are offering, real.

3. Eliminate or minimize distractions to your discussions.

4. Emphasize the advantages of what you are offering.

5. Allow catharsis of the prospect or customer's fears.

6. Stimulate the prospect or customer's discontent with anything less than what you are offering.

To Deal with Pricing Problems:

1. Investigate possible smokescreens.

2. Use sandwich technique (i.e. advantages vs. disadvantages).

3. Broaden the customer's perspective to all advantages of your suggestions.

4. Match his or her needs against your offering and its advantages.

5. Examine costs - item by item. Don't hesitate to show your pricing work sheets.

6. Don't negotiate on the basis of generosity.

7. Create favorable illusions (i.e., give the prospect or customer a throwaway if appropriate).

8. Give the prospect or customer a less attractive choice.

9. Overstate the prospect or customer's objections.

10. Explore the cost of a bad decision or no decision.

Each point above should be examined and reviewed in detail. As quick reminders, they serve to emphasize the need to always be aware of what it is your prospects and customers require. Make sure you understand what motivates them; then always indicate and convey your desire to work with them to achieve the things that can be best obtained from you and you alone.

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I. The Role of the Estimate and the Proposal

I. Definitions

A. **Estimate**
An Approximate statement of what would be charged for certain work to be done submitted by one ready to undertake the work. (American College Dictionary)

B. **Proposal**
A plan or scheme proposed. (American College Dictionary)

C. **Indexing**
The application to previously well defined estimating units (usually proven by in-place cost experience) of a series of percentage factors so as to relate a then condition to a now condition.

D. **Profiling**
Preparation and use of a selective, flexible and operable system of screening for optimum use.

II. General Observations

A. Before any estimate of any type is prepared, some valid and serious profiling should be done. Profiling tools include financial ratings, Dun and Bradstreet reports, Standard Industrial Classifications and decision tables.

B. An estimate and a proposal are two different objects. Proposing is the real key to success in any competitive field!

C. A proposal reflects consideration of a myriad of factors relating to your approach. You should propose, not bid.

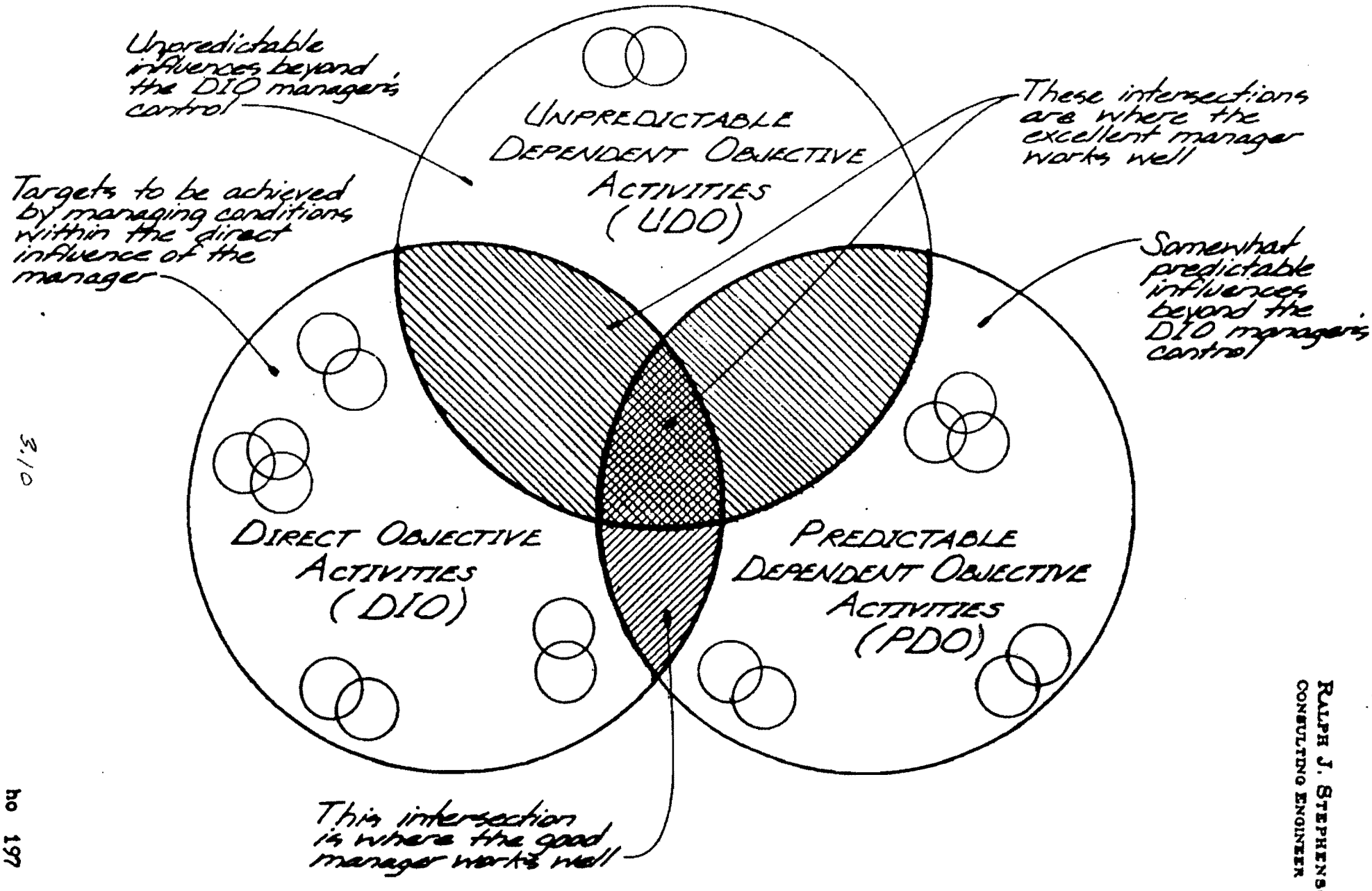
D. Some commonly used methods of estimating include:

1. By area and building profile
2. By volume and building profile
3. By system and building profile
4. By quantity survey and unit cost
5. By appraisal replacement
6. By assembly of other source estimates
   Note: All above methods must be subjected to indexing.

E. Factors making up a construction index include:

1. Construction volume in area
2. Company work load
3. Season of year
4. Type of facility to be constructed

5. Material costs
6. Labor costs
7. Labor efficiency
8. Labor availability
9. Trade contract expiration date



THE DIO/PDO/UDO INTERSECTION

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3.10

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NINE MAJOR STEPS TO EFFECTIVE PROJECT MANAGEMENT

DEFINITIONS

- PROJECT - A set of work actions having identifiable objectives, and a beginning and an end.

- EFFECTIVE - Of a nature that achieves identifiable goals and objectives in accordance with an action plan, and reaches worthwhile peripheral goals through intermediate accomplishments.

- MANAGEMENT - The identification, assembly and direction of resources to achieve desired results.

QUESTION

- What is different about project organization compared to functional organization?

1. Project organization is usually temporary.

2. Project organization is usually based on a different rationale than is functional organization.

3. Project authority positions tend to be vested first and earned later.

STEPS TO GOOD PROJECT MANAGEMENT

- A good project seems to require 9 major steps, done well, to be successful.

1. Goals and objectives for the project are clearly identified, and starting, intermediate and ending measuring points established early in the project life.

2. A suitable project delivery system is selected as the goals & objectives are defined.

3. An action plan showing desired and necessary courses of action from beginning to end of the project is prepared.

4. The action plan is translated into schedules, and the resources needed are determined and balanced for most profitable performance.
5. A project organization is built under (not over) the resources required to provide resource management quality, continuity, and monitorbility.

6. A method of isolating, identifying and correcting deviations from desired performance standards is designed and put into action.

7. The needed resources are assembled and the project team gets to work.

8. Progress and performance of the project team is measured and evaluated using management by exception.

9. The project is closed out promptly, cleanly, and totally as work draws to a close.

ho 223 March 1996

Act from a Plan - If you can't plan it, you can't manage it. Good plans shape good decisions.

I. **Five essential planning questions for the manager to ask and answer.**
   A. What?
   B. Where?
   C. When?
   D. How?
   E. Who?

II. **Five essential planning actions for the manager to take.**
   A. Set goals and objectives.
   B. Prepare and action plan.
   C. Organize the work.
   D. Assemble the resources needed.
   E. Do the job.

III. **Set goals and objectives.**
   A. Definitions
      1. Goals - Targets, desires, wishes and aims expressed without a time scale.
      2. Objectives - Expressed goals upon which a time frame has been imposed.
   B. The DIG/DEG/DOG
   C. Be specific when setting objectives.
   D. Set objectives so that movement toward their achievement can be measured.

IV. **Prepare and action plan.**
   A. May be verbal, written, or visual.
   B. May be strategic or tactical, detailed or summary.
   C. May be short, medium, or long range (the manager must set the planning time scale.
      1. The shorter the time interval covered by the plan, the greater is the chance the plan will succeed. However, the shorter the time interval, the greater the probability that longer range needs, which truly measure the manager's effectiveness, will remain unfulfilled.
      2. The higher you are in the management structure the larger and longer the planing scale you must use.
      3. The concepts of decision to action time span.
   D. Plan the work and work the plan!

V. **Organize the work**
   A. Plans should be build upon maximum integration of management viewpoints.
   B. Establish relationships through functional diagraming of interconnections.
      1. Formal.
      2. Informal.
      3. Reporting.

4. Staff.
5. Temporary.

C. Mack clear cut assignments.
   1. The manager should not assume a person will automatically know his full pattern of responsibilities.
   2. Don't leave definition of authority and responsibility to chance. Be specific.

D. Build a feedback system.
   1. Grapevine often used in informal feedback.
   2. Formal feedback system should be built by specific assignment (must have a standard of performance for the feedback system to work well).

E. Organize to accomplish goals and objectives.
   1. Keep organization lean - avoid unnecessary overhead.
   2. Make provisions in the organization to delegate and train.
   3. Tend to build around targets and needs rather than people (there are major exceptions to this, watch carefully)
   4. Provide for proper grading of decision to action time spans.

VI. **Common planning failures**

A. Not touching all organizational bases - what, where, when, how, and who.
B. Committing to too many goals ad objectives at one time.
C. Underestimating the value and need for good forward planning.
D. failure to challenge plans and actions at the right time.
E. Not providing proper escape hatches and safeguards.
F. Failure to encourage timely, knowledgeable participation.
G. Not obtaining higher level approvals of goals and objectives.
H. Inadequate monitoring and control of costs, progress, documentation and resource loading.
I. Poor assignment of duties, responsibilities, and actions.
J. Failure to understand that planning is a major task of the manager.

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CREATIVITY AND HOW IT IS USED IN PROJECT MANAGEMENT

Creative thinking is an essential ingredient to successful project management. It helps the alert project manager to solve problems, establish management patterns, provide leadership and motivation, and to insure that design, quality and cost integrity of a project is maintained.

Creative thinking is applied to the management process on a routine basis by continuing to learn with an open mind; being among the first to accept something new while being among the last to discard the old.

There is also a special requirement for creative thinking that demands getting rid of what Roger von Oech in his book, A WHACK ON THE SIDE OF THE HEAD, calls mental locks. These mental locks are recognized by such familiar phrases as:

1. I'm looking for the right answer.
2. That isn't logical.
3. Be certain to follow the rules.
4. Let's be practical about this.
5. And don't make any mistakes.
6. Playing is a waste of time.
7. That's not my area of work.
8. Don't be silly.
9. But I'm not a creative person

The above statements indicate a set pattern of thinking, that when used blindly, get in the way of the creative process.

Other major obstacles to thinking creatively include making premature judgments, and excessive use of the self fulfilling prophecy. The self fulfilling prophecy usually indicates you have your mind made up before even starting any heavy thinking about the idea. You then never give your brain a chance to do any creative thinking.

Remember, it is nearly impossible to be creative and judgmental at the same time. So, in project management it is a good idea when creatively considering a complex matter to prepare a random, or non judgmental, laundry list of things that have to be done or thought about. The list should include all items within reason, whether or not you and the others involved think it should be included. Often the combination of a single idea of doubtful merit is a brilliant thought in league with other ideas.

Processes of creatively tackling a problem have been used for hundreds of years by many excellent thinkers. The creative procedure can be described in six major steps.

1. Gather all facts that time will allow, about the subject under consideration. Try not to be judgmental while you are collecting information.

2. Think hard about the data and the other information you have gathered in relation to the problem or situation you are involved with.

3. Forget about the problem! Let the material looked at so far, and the ideas you might have, get mulled over by your subconscious. This period is called gestation.

4. Ideas (illumination!) will usually start springing to mind soon after the gestation period starts. However, in some cases it might take several days, weeks, or even months. Be alert for the sudden revelation of the solution. When the solution or idea or lost thought appears grab it and write it down!

5. Act on the solution, idea or thought!

6. Follow up and check to see if the solution was a good one and if it has worked.

Creativity is a simple, elegant way of life. All you must do to enjoy it is to unlock your thinking, exercise your mind and use your imagination!

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Notes on Forerunner & Conservatively Managed Companies

• What are alternative names to forerunner and conservatively managed companies? Proactive & reactive, positive & negative, front & back, do & wait, high risk & low risk, maximum & minimum, go & no go, try & no try, run & walk.

• The forerunner managed company tries to optimize the probability of being right.

• The conservatively managed company tries to minimize the probability of being wrong.

• It is critical to understand that both types of companies can be, and often are successful or unsuccessful. The style of forerunner or conservative is merely an indication of the way the organization achieves success or goes through the twinges of failure.

• Some characteristics of the forerunner vs the conservative company are:

Forerunner
- Aggressive in their field of work
- Young
- High risk takers
- High leveraging of all resources
- Good morale
- General absence of recognizable management structure
- Healthy cooperation among lower management
- Strong competitive drive at all levels of management
- Strong sensing (not necessarily knowledge) of total purpose about
  - Financial return on investment
  - Social obligation
  - Professional integrity
  - Technical excellence
  - Ethical behavior
- Provision of sense of worth to projects
- Provision of sense of exciting flux to staff
- Maintenance of an exciting environment
- Constant forging ahead in their business arena
- Desire & ability to adapt to positive change
- Desire & ability to institute change
- Desire & ability to accommodate change
- Medium to low levels of incompetence tolerance
- Strong leaning toward high individual performance levels
- Low level of interest in business planning
- Often learn by mistakes

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Conservative
- Usually well managed from top down
- Moderately well managed from bottom up
- Tends toward paternalistic management
- Major decision making centered in top management
- Good financial strength, if mature
- Dependable
- Predictable
- Closely controlled employee training
- Modest salary structure
- Good standard employee financial benefits
- Usually stress hygiene as opposed to motivational drive
- High levels of employee loyalty in those who like the system
- Provision of employee security
- Generally pretest decisions at executive management levels

ho 315 March 1996

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CASE STUDY

The Unique Opportunity at Buffalo

You are a hard working, conscientious employee of Buffalo Development Company, a small diversified firm which concentrates on acquiring, planning, improving and marketing commercial and industrial properties. The scope of your firm's services includes real estate, property management, limited planning/architectural/engineering design (with outside consultant capabilities), construction, as well as necessary support activities such as financing, leasing and market studies.

The firm has grown from a small informally run organization of ten hard working people, all of whom considered themselves business peers, to a company having almost 70 employees, many responsible for multiple activities they inherited as the company grew. The problems that normally accompany growth including fuzzy responsibility definition, conflicting communication lines, increasingly frequent management paralysis, internal jockeying for position and apparent inequities in reimbursement and benefits, have begun to gnaw away at the company's ability to perform in the same high quality manner as previously.

Last month a unique opportunity opened to Buffalo for development of a major recreational parcel in New England. This would bring under company control nearly 5,000 acres of recreational land, offering exceptional development potential for skiing, swimming, hiking, backpacking, horseback riding, as well as a very lucrative opportunity for resort and commercial hotel facilities badly needed in the area.

The project is the catalyst that forces you to grips with the other problems that have begun to wear down the staff of Buffalo. Presume you are a person whose judgment is respected and to whom people in the company will listen.

(From this situation, we will build one or more problem cases that will simulate by role playing situations you may face as a responsible staff member of Buffalo.)

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Closing Out A Construction Project

A random summary of close out guidelines for owners, architects, engineers and contractors

The process of closing out a construction project has emerged as one of the most important sequences of events a project team may encounter during the course of the project. Reasons for this are:

• The close out process usually results in a formal and legal acceptance of the facility by the owner or occupant. Thus responsibility for the correctness of the work passes from the design and construction team to the owner. The transition must be clear and indisputable to avoid contested claims and residual obligations.

• The conditions imposed by the warranties on workmanship, systems and equipment must be clearly defined and accepted by all concerned if adequate guarantees of performance are to be placed in force.

• The design and construction team must have a definitive point in time where their contractual obligations have been fulfilled and they can consider their legal relations closed out so far as project design and construction administration and operations are concerned.

• The owner must have a specific point in time where he can consider the project legally his without any hang over potential encumbrances from the design or construction team.

• The design and construction team must be able to use the project as a facility which they have no hesitation in describing or showing to prospects and current clients.

• A well closed project is insurance of future good relations with specialty contractors on the job as subcontractors of the prime contractors.

• The properly closed project makes no unreasonable or unpredictable demands on the design and construction staff subsequent to the close out.

The close out process does not start as the construction phase is being completed but long before. Closing out is an ongoing action. Throughout all phases of the job the experienced
construction team studies the documents and the work so as to set how each element can best be turned over to the owner in accordance with the contract.

Some of the many steps to be taken to properly close out a project are given below. The list is for all parties to the contract, since most are involved in the close out phase. Parties indicated in ( ) are those most concerned with the item. Where multiple parties are indicated it does not necessarily indicate the parties must participate together in the action.

The list is at random. (Note: This list will be arranged by categories as items are added)

1. Prepare a construction record package. This set of documents was formerly called the as built drawing set. (contractor)

2. Obtain, where appropriate, a certificate of occupancy, or equivalent document, from the local building department, or other regulatory and enforcement agency. (owner, architect/engineer, contractor)

3. Prepare, distribute and have approved by the owner, the architect/engineer and the contractors, a punch out procedure. (contractor, architect/engineer, owner)

4. Punch out the project and complete the punch list requirements within an agreed upon time frame. (architect/engineer, contractor, owner)

5. Prepare, submit and accept the operating and maintenance manuals for the total project. (contractor, owner)

6. Clear final payments on the project and obtain proper waivers of lien. (contractor, owner)

7. Provide the owner with a proper set of construction documents for reference use. (contractor, owner)

8. Collect and store job logs, diaries, daily reports, test reports and all other documentation generated by the job activities. (contractor, owner, architect/engineer)

9 . Bring all meeting minutes and record files up to date so as to permit easy use and retrieval of needed information. (contractor, owner, architect/engineer)

10. Collect and bind all official and unofficial project photos. (contractor, owner, architect/engineer)

11. Collect and record all project network plans, schedules and bar charts by issue number, subject and date. (contractor, owner)

12. Close out and store all correspondence and other record files. (contractor, owner, architect/engineer)

13. Assemble and properly store all shop drawings and other job related submittals. (contractor, owner, architect/engineer)

14. Request the architect/engineer of record to make an inspection resulting in the granting of a certificate of substantial completion. This may be required to to obtain a certificate of occupancy. (contractor, owner)

15. Plan and implement grand opening or preview festivities for major team members, company principals and others contributing to the planning, design and construction of the facility. (owner, contractor)

16. Each party should conduct their own job critique during which responsible parties to the project meet and identify points of strength and weaknesses in carrying out the job. One major product of this critique should be a set of recommendations for improvement of future performance, and documentation of the problems encountered and how they were resolved. (contractor, owner, architect/engineer)

17. Relinquish, or account for, all client owned tools, spare parts, and extra stocks of materials, rightfully the property of the owner. (contractor, owner)

18. Provide the owner copies of all releases, including final inspection certificates, occupancy permits, operating certificates, health department approvals and permits, and all other similar documents to allow the owner to occupy the building under full understanding of the conditions of the turnover. (contractor, owner, architect/engineer)

19. Label all electrical panel boxes, plumbing lines, valves and equipment as required for proper operation and maintenance. (contractor)

20. Provide all keys and keying schedules. (contractor, owner)

21. Submit a final statement of accounting, as required, to the owner and the architect/engineer. (owner, contractor, architect/engineer)

22. Obtain, prepare or issue a final change order reflecting adjustments to the contract sums not previously

made by change orders. (contractor, architect/engineer, owner)

23. Send sincere thank you letters as appropriate to the owner, to the design team and to various contractors involved on the job. (contractor, architect/engineer)

24. Provide the owner a complete list of contractors and vendors participating in the job and indicating their installation responsibilities. (contractor)

25. Insure the owner is placed on the marketing call list, mailing list and other action tickler files as appropriate. (contractor, architect/engineer)

26. Arrange for such open house activities as may be desired or required (owner, contractor, architect/engineer)

27. Insure that your company identification is shown somewhere in the building if permitted. (owner, a/e and contractor)

28. Insure the project is as clean or better than called for in the specifications when your staff moves off the job. Don't lose the good will of the owner by leaving him a dirty job. (contractor)

29. Properly train and turn over the facility to the owner's representatives. Depending on the size and complexity of the project, the training process should begin from one to three months before occupancy. (owner, contractor)

30. Establish and approve the start of all warranty and guarantee periods for all material and equipment on the job prior to owner making the facility operative. (owner, contractor, architect/engineer)

31. Prepare and submit to the owner a Construction Record Package. This package should contain the following: (contractor)

a. The construction record set referred to above.
b. Specific warranties required by the specifications
c. Workmanship or maintenance bonds required
d. Maintenance agreements called for by the specifications
e. Damage and settlement surveys of the site and the facilities
f. Final property surveys of the site.

32. Submit a final billing to the owner containing a list of all incomplete items and a properly assigned cost to each item. (contractor)

33. Advise the owner of any insurance changes over existing or past requirements or dates. (contractor, architect/engineer)

34. Complete all pre start up testing, run in and instruction along with submission of operating and maintenance manuals. (contractor, owner)

Note: All pre start up and start up requirements should be fully described in the contract documents and clearly referenced to the warranty period.

35. Submit final meter readings for utilities, and measured records of stored fuel at the time of substantial completion. (contractor)

36. Submit to owner, the consent of surety to final payment if required. (contractor)

37. Have final inspection made by an experienced exterminator to rid the job of rodents, insects or other pests. (contractor, owner)

38. Read the full contract document requirements (drawings, specifications, and contract) for closing out the job. (contractor, owner, architect/engineer)

39. Provide the owner a certification as to the building area calculations including gross square footage leasable square footage, and area use assignments.

AIA Michigan Annual Convention
Project Delivery Systems
Soaring Eagle Casino Resort
Mt. Pleasant, Michigan

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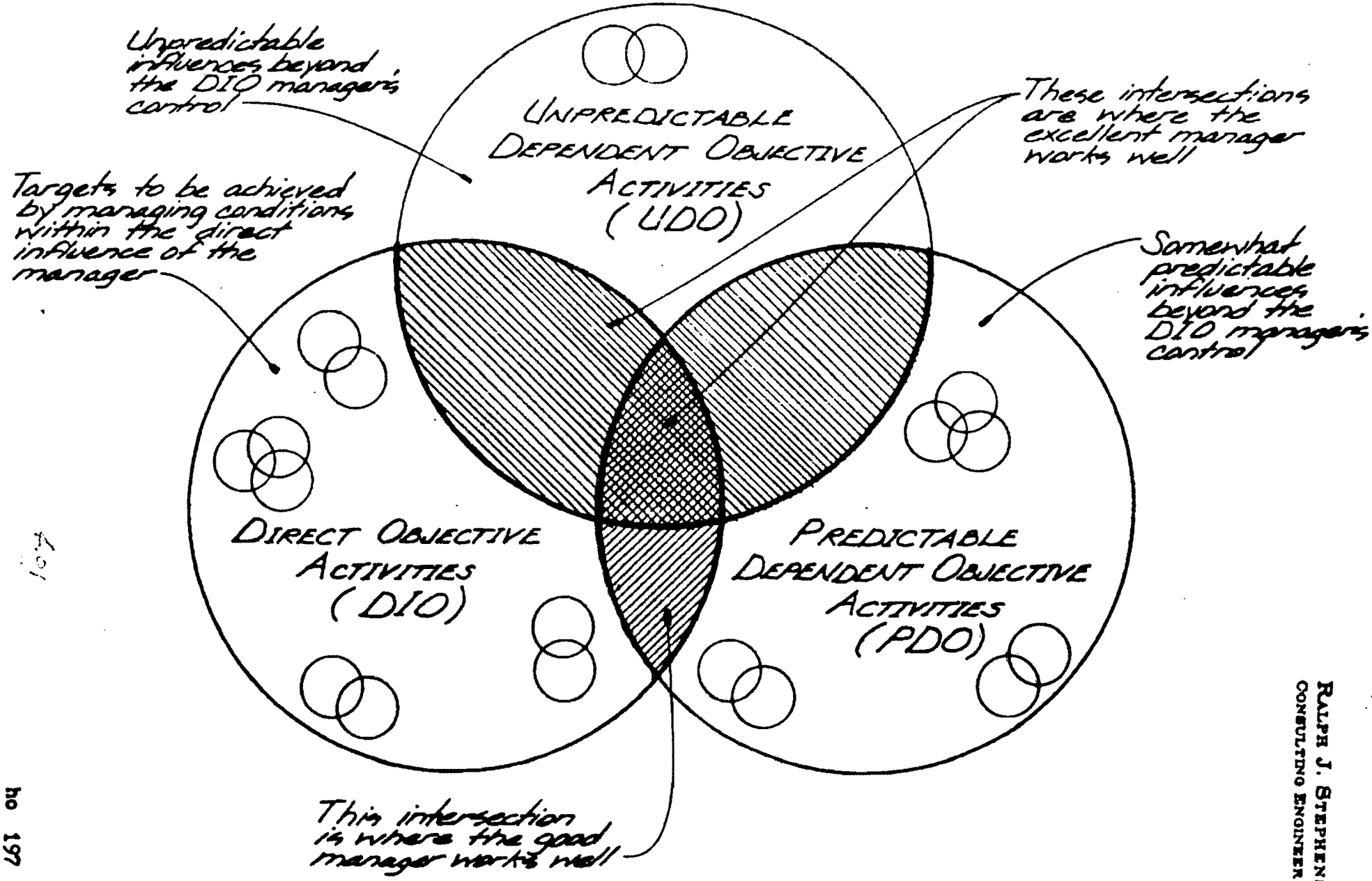
Section #4 - Challenges offered in extended project delivery system that influence business, professional and design success success



THE DIO/PDO/UDO INTERSECTION

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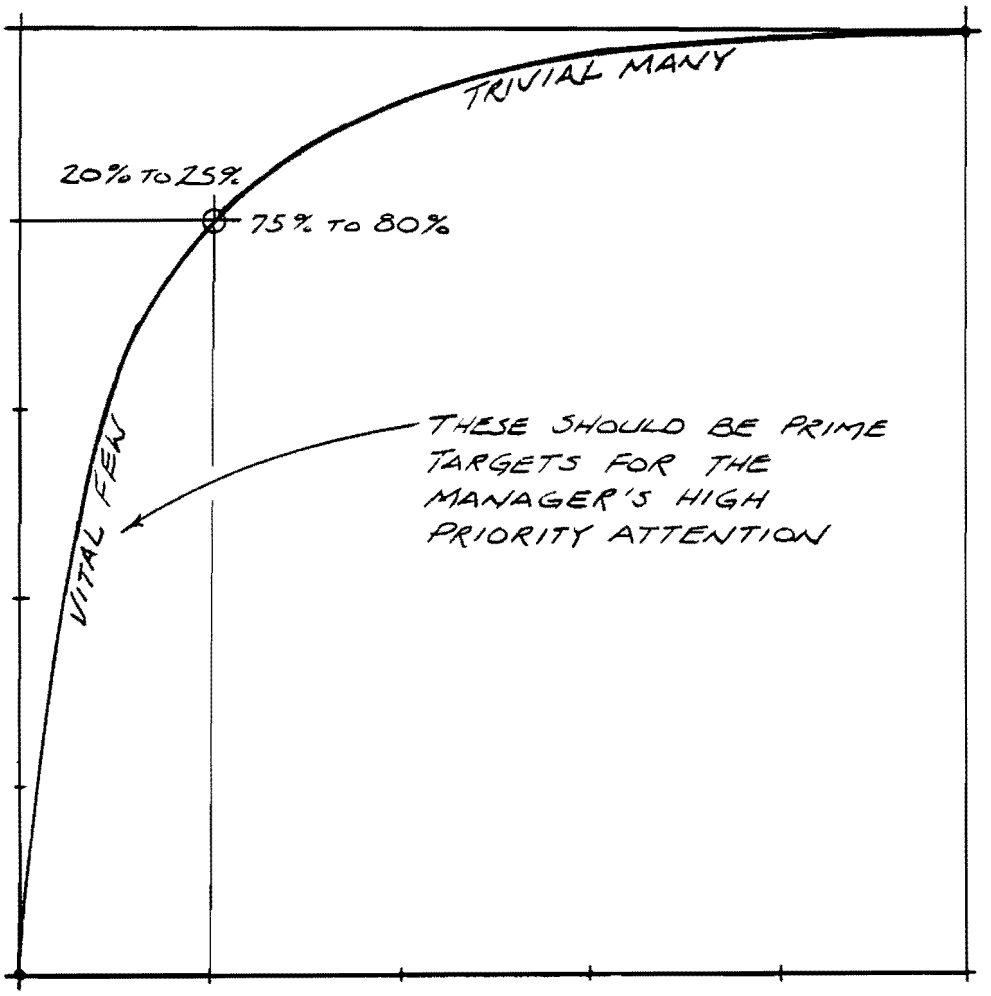
PARETOS LAW - IN AN OBJECT/VALUE SITUATION ONLY A FEW OF THE OBJECTS ACCOUNT FOR THE GREATEST PART OF THE VALUE.



VALUE OR UTILITY

PRICE
COST
DELAYS
MISTAKES
PROBLEMS
PROFIT
REJECTS
SALES
SAVINGS
SHIPMENTS
WASTE

OBJECTS OR RESOURCES

ACTIVITIES
CAUSES
OCCURANCES
PROBLEMS
RESOURCES
PRODUCTS
DECISIONS
FACILITIES
MATERIALS
METHODS
PRODUCTS
SALES CALLS
SERVICES
STAFF

H/O 146

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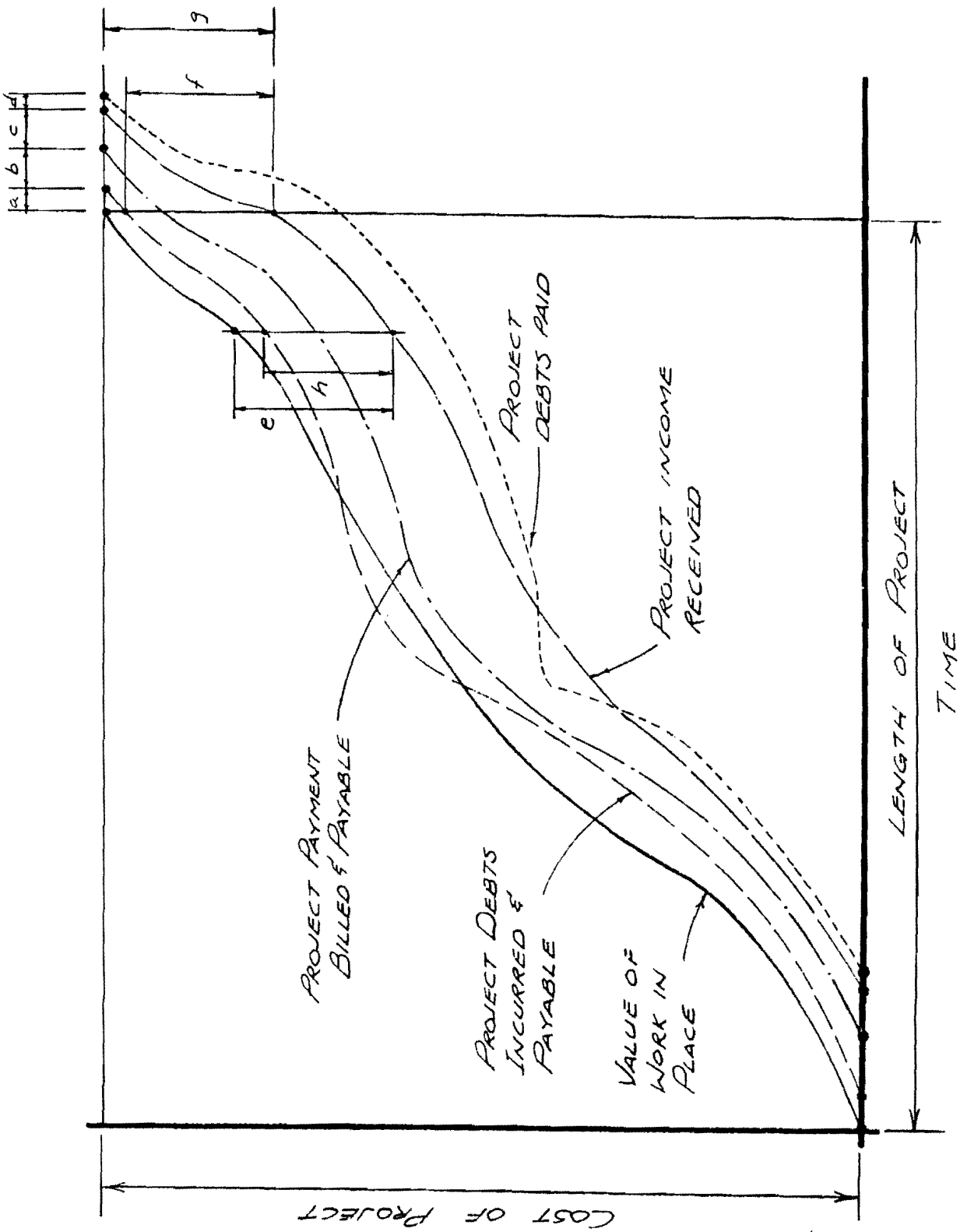

PROJECT MONEY FLOW

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Kinds of estimates

1. **Estimating can be defined as an approximate statement of what would be charged for certain work to be done submitted by one ready to undertake the work. Other definitions have been proposed but they all lead to the conclusion that estimating is fundamentally the art and science of predicting what the total cost actually will be. This estimate classification system takes into account the functional characteristics of the specific estimate to be made. It considers ten elements.**
    1. Point in time at which estimate is prepared
    2. Scale of detail required
    3. Estimating methodology
    4. Life span covered by costing
    5. Data available
    6. Ultimate use of estimate
    7. Number of elements estimated relative to total
    8. Competitive situation
    9. Role of estimate in setting final cost
    10. Control position
2. **A meaningful classification system results if we assign values or weights to identify the requirements of the specific estimating situation.**
    1. **Point in time at which estimate is prepared.**
        1. Conceive
        2. Program
        3. Articulate
        4. Approve
        5. Design
        6. Construct
        7. Turnover
        8. Operate
        9. Maintain
    2. **Scale of detail required**
        1. Very rough detail, using general rules of thumb
        2. Generalized combination system in rough detail
        3. Moderate detail by unit or component modified with general historical and current data
        4. Great detail modified with specific historical and detail current data.
    3. **Estimating methodology**
        1. Replacement or appraisal technique
        2. Historical unit area or volume figures indexed for current use

3. Major component costing and assembly indexed for current use
4. Detailed time and material estimates of elemental units (individually assembled at time of estimating)
   The fundamental difference between component costing and costing from elemental units is that in the first the elemental units are pre-assembled and pre-estimated so that they are not evaluated each time the component is encountered in the project.

4. **Life span covered by costing**
   1. Cost of initial installation only
   2. Cost of installation, and short operating and maintenance cycle
   3. Cost of installation, and long operation and maintenance cycle
   4. Cost of installation, and total operation and maintenance over life of investment.

5. **Data available**
   1. Very little
   2. Moderately adequate with supplementary research
   3. Generally adequate
   4. As much as required

6. **Ultimate use of estimate**
   1. Conceptualizing - to gain basic idea of scope - usually very rough figures
   2. Comparative evaluation - to measure on an equal basis several elements or combinations, all relative to a common datum
   3. Budgeting - to provide a basis for allocating capital funds, maintenance or operating costs or other expenditures on a given program prior to its final design but after its conception
   4. Competitive - to give the ultimate decision-maker in an environmental design and construction program comparable, firm values by which he can select all elements of the program to optimize its effectiveness

7. **Number of elements estimated relative to total**
   1. Small part of total
   2. Moderate part of total
   3. Major part of total
   4. Most or all of total

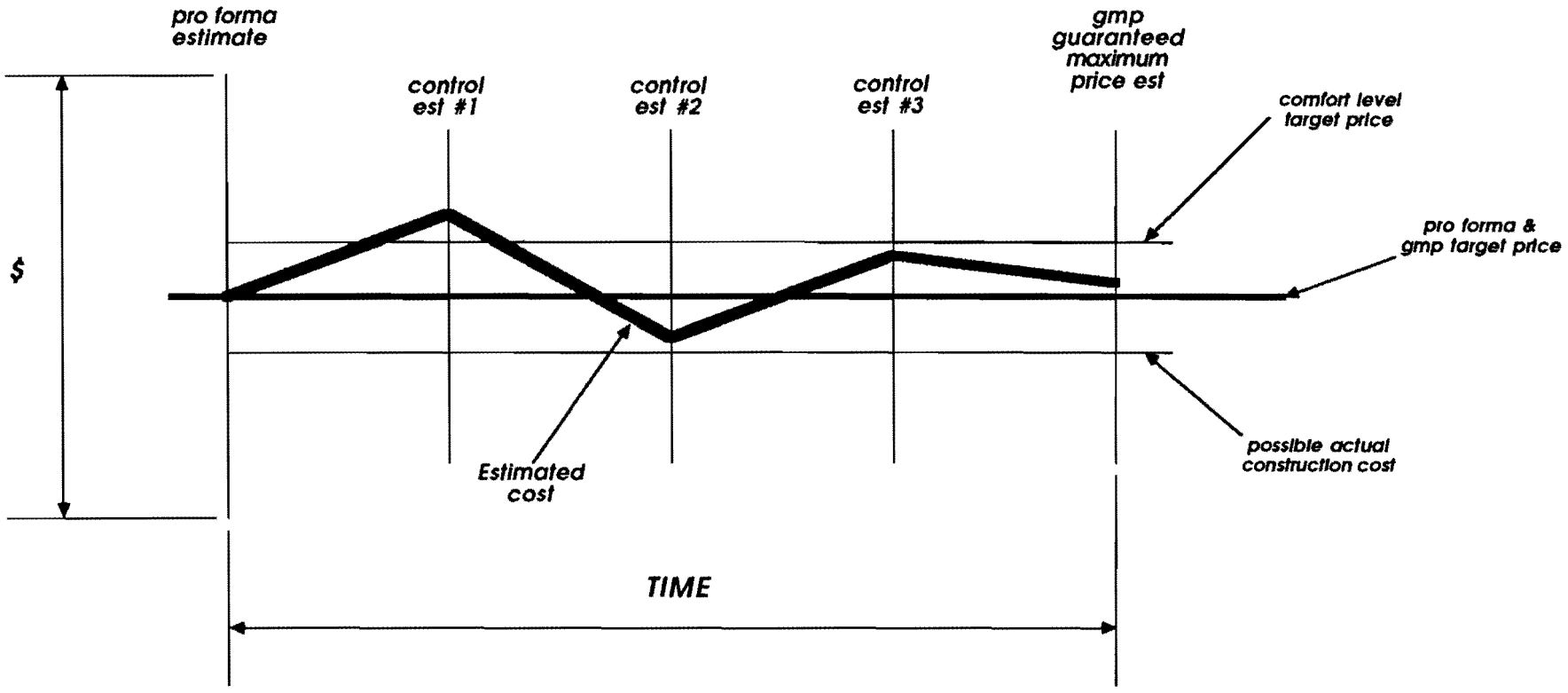
8. **Competitive situation**
   1. No competition
   2. Moderate multi value competition
   3. Heavy single value competition
      Multi value competition is a relative evaluation based upon several factors such as size, quality of management, experience, present work load and

financial strength.

In single value competition, all of these reduced to a lone bid. Such is the case on public projects where the only requirement to be on the bidding list is that an adequate bond be available

9. **Role of estimate in setting final cost**
    1. to set capital costs only
    2. To set financing, operating and maintenance cost only
    3. To set all project costs through a specified period of time
10. **Control position occupied**
    1. No control exerted
    2. Minor controls possible
    3. Major controls possible
    4. Total control of program

    Much elaboration is possible on control positions. the code suggested is a simplistic approach and in actual use might be modified to reflect to what the control is applied. Control position may extend to labor, material, land, money, design, construction or sub contractors among others.



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THE ITERATIVE COSTING SEQUENCE

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Turnover Cycle (t) Example

Definitions:

x = completion date in working days (wd)

i = starting date in working days

d = duration in elapsed working days to complete one unit

t = turnover cycle in working days (the number of working days between the completion of one unit and the completion of the next.)

n = number of units

Basic equations:

$$x = i + d + t\,(n - 1)$$

$$i = x - d - t\,(n - 1)$$

$$t = \frac{x - i - d}{(n - 1)}$$

Examples:

For x unknown

i = 160

d = 7 wd

t = 4 wd

n = 11 units

For i unknown

x = 325

d = 10 wd

t = 6 wd

n = 21 floors

For t unknown

x = 352

i = 280

d = 9

n = 15 sectors

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COMMON CAUSES OF CONTESTED CLAIMS

Contested construction claims have increased over the past few years and now must be recognized as a serious road block to proper and profitable construction procedures.

The reasons for the increase in contested claims are many and must be understood in the sense that our society has become somewhat legalistic. That is to say, the recourse to legal resolution, as opposed to interpersonal, technical, or administrative resolution of problems has become a common fortunately shows some signs of diminishing as costs and time involvement in legal matters have increased astronomically.

However, there are claims, there always have been claims, and there will probably always will be contested claims. Those in construction should however, thoroughly understand the structure of the contested claim.

Specifically, contested claims lead to resolution by an administrative settlement, litigation, arbitration, or mediation. There are some common causes of conflict and it is these that stimulate the parties to go to a formal settlement by outsiders. It is important for those in construction to understand how to avoid the mistakes that cause wasteful contested claims.

Several years ago a firm specializing in construction claims and their settlements studied some of the most common causes of disputes. Of two hundred occurrence of contested claims the following percentages were found.

1. Directed Change - 48%

A legitimate change within the contract scope for which the owner must pay.

Examples
- Owner changes the door color after the door is painted.
- Owner revises size of electrical room door opening

Advice
- Required extensions of time should be stated in writing.
- Costs for extended general conditions should be agreed upon early.
- The client or owner is obligated to pay for the change, if there is a charge.
- Payment for the work should be explicitly agreed upon before starting.

2. Constructive change - 42%

An owner's action or inaction that has the same effect as a written order.

Examples
- Shop drawing corrections, showing additional work not covered in contract documents.
- Owner's representative tells a superintendent to relocate a wall with no payment intended.

Advice
- Don't assume changes will be free. Find out if there is a cost.

- Don't enrich contract documents.
- Don't enrich shop drawings.
- Make certain the scope and costs of additional work is clearly understood.

3. Defective or deficient contract documents - 41%

Contract documents which do not adequately portray the true contract scope.

Examples
- A retaining wall shown dotted on the contract documents and expected by the architect/engineer and the owner to be built as part of the contract.
- Dimensional errors that cannot be resolved by verbal clarification.
- Contract documents that expect performance by default. For instance, specifying a miscellaneous iron ladder but not showing it on the drawings.

Advice
- Expect to pay your architect and engineer for good quality assurance in the production of contract documents.
- Select your design team on the basis of performance not cost.
- Clearly define design and construction delivery methods to be used.
- Don't expect your contractor to design the job unless it is a design/build project.
- Don't make unrecorded corrections to contract documents.

4. Delays - 41%

A delay situation beyond the control and not the fault of the contractor.

Examples
- Rock encountered that delays the job but was not shown on the contract documents.

Advice
- Be as thorough as possible in defining physical conditions of the site upon which the facility is to be constructed.
- Specify weather standards when it is necessary to clarify time extensions that might be caused by inclement weather.
- Determine delay costs quickly and eliminate them as soon as possible.
- Don't stop field work without proper authority and a very good reason.

5. Constructive acceleration - 35%

More work with no time extensions, or the same work and a shorter time period in which to do it.

Examples
- Owner refuses to grant time extension for work that will take longer to perform.
- Owner makes unauthorized use of critical path time without extension.
- Owner makes use of float time with the expectation that the contractor will not request or require a

time extension.

Advice
- Never assume the contractor will do extra work within the contract time.
- Work out an early agreement on the use of float time in the network model.
- Never assume a field order is a no cost, no time extension change.

6. Maladministration - 35%

Owner interference with the contractor's right to enjoy least cost performance.

Examples
- Owner directs contractor to provide a certain space in a facility early without such early turn over having been specified in contract documents.
- Owner directs contractor to start work on an encumbered site.
- Architect/engineer unresponsive to legitimate requests for information.

Advice
- Always allow the contractor to select construction methods and means.
- Make certain the site is fully available to the contractor before the job begins.
- Process submittals promptly.
- Clearly define the time frame and the sequence by which submittals are to be processed, and do it early in the job.

7. Differing site conditions - 31%

The actual site differs from that represented on the contract documents, or deviates from ordinary or normal expectations of such a site in that area.

Examples
- Artesian water encountered in sand seam outside of where soil borings were taken.
- Existing basements encountered but not indicated on contract documents.
- Restrictive easements or assessments on the property not made known to the contractor before contract execution.

Advice
- Expect to pay for and get a good site survey
- Make certain soil borings are adequate to show any unusual conditions.
- Locate and define all easements.
- Check the site history for unusual or restricted conditions.
- Take photos of any unusual conditions encountered.

8. Impossibility of performance - 18%

A situation where it is impossible to carry out the contract work.

Examples
- Expecting a contractor to work on an encumbered site.
- Owner refuses to move interfering utilities he is supposed to relocate by contract.
- Specifying installation of above ceiling work that won't fit in the space provided.

Advice
- Expect the design team to check their work thoroughly for interferences.
- Accept your legitimate design and administrative duties and responsibilities and take care of them.
- Resolve dimensional difference early.
- Do your homework to presolve expected problems and interferences.

9. Superior knowledge - 18%

Withholding data or information during the pre contract period, that affects construction on matters of importance.

Examples
- On a steel erection contract not telling the bidders that the steel had been refabricated from a previous job.
- Failing to tell bidders that there is a cost cap on the first two months costs
- Not telling bidders that there is a high pressure gas line through the site that must be accommodated during construction.

Advice
- Be certain all bidders know as much as they must know to propose properly.
- Be certain demolition contract documents specify all work to be done.
- Locate, to the best of your ability, all site obstructions before bidding.
- Don't expect the contractor or the architect and engineer to read your mind.

10. Termination - 7%

Dismissal from the project for convenience or default.

Examples
- The section of the project is no longer needed and is removed from the contract.
- The contractor is behind schedule.
- The contractor's performance is unsatisfactory.
- The owner doesn't like the way the superintendent talks back to him.
- The contractor doesn't manage submittals promptly and accurately.

Advice
- Be certain the cause for dismissal is legitimate and well defined.
- Don't dismiss for minor reasons. Dismissal is serious business.
- If dismissing, be certain proper notice is given.
- Insure the contract documents give you the right to dismiss.

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CONSTRUCTION CONTROL DOCUMENTS

• PROGRAM - A narrative statement of the project requirements, characteristics, and allowable costs.

• WORKING DRAWING - Graphically define the contract scope of work & show the appearance of the completed project.

• SPECIFICATIONS - Verbally describe the contract scope of work and define the qualitative standards to be maintained in the completed project.

• CONTRACT DOCUMENTS - Provide a full definition of the scope of project work to be built. Any item included as part of the contract documents becomes a condition of the contract.

• ESTIMATES - Verbally describe the quantitative standards to be achieved in the completed project.

• PLANS & SCHEDULES - Graphically define the sequences, procedures & amount of resources to be used to construct the project.

• SHOP DRAWINGS - Graphically show details of the fabrication, installation and final appearance of building components called for in the contract documents and accepted for use in the work.

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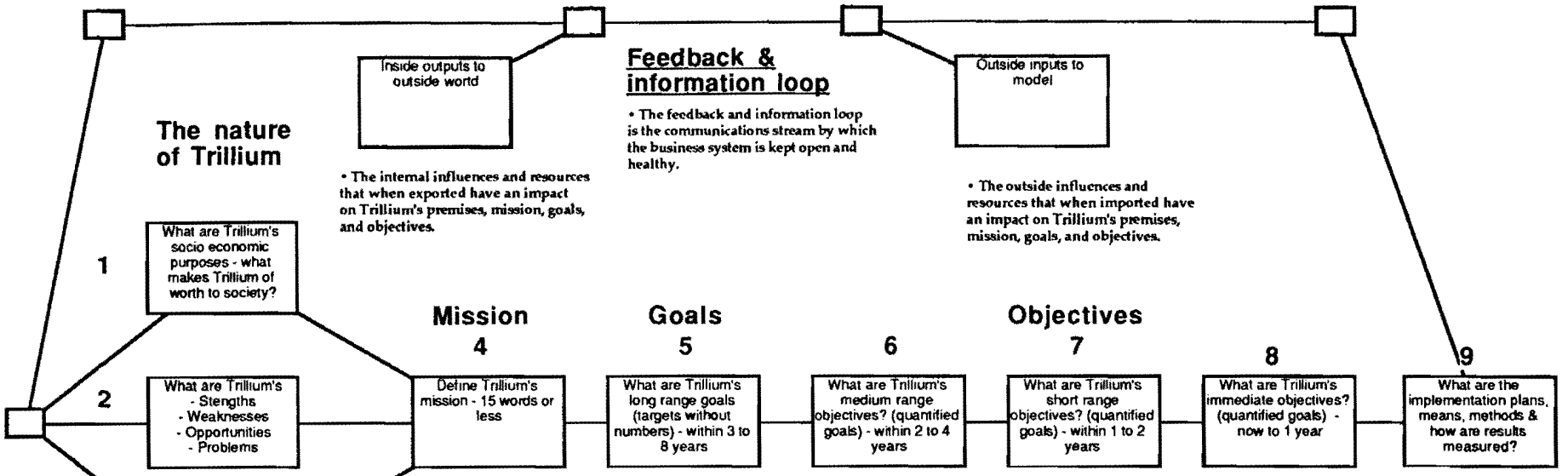
Questions of help in setting business objectives for business model

1. What business are we in?
2. What is our principal product or service?
3. What market do we serve?
4. What common qualities define our customers?
5. What is our predominant image with clients?
6. What is our major competitive edge over others in our business?
7. Where are we at a disadvantage in comparison to our competitors?
8. What business do we want to be in 5 years from now?
9. What major changes will we need to make to get there?
10. What is our present return on investment?
11. What return on investment is reasonable for persons in our kind of business?
12. What share of market do we now have?
13. What share of market do we want next month? Next year?
14. What is the major strength of our organization? How are we using it?
15. What is our major organizational weakness?
16. How can we solve it?
17. What are our specific goals for profit improvement?
18. In what ways do our personnel policies chafe our employees?
19. To what degree can we count on our key people?
20. How can we finance growth?

The above are habit forming questions designed to <u>force</u> you to look ahead.



• The internal influences and resources that when exported have an impact on Trillium's premises, mission, goals, and objectives.

• The feedback and information loop is the communications stream by which the business system is kept open and healthy.

• The outside influences and resources that when imported have an impact on Trillium's premises, mission, goals, and objectives.

• The nature of Trillium states the premises upon which the organization is built.

• The mission of Trillium is the most important result to be achieved by Trillium being successful.

• The goals of Trillium are the unquanitified long range targets which management wishes to reach.

• The objectives of Trillium are the quantified goals which management wishes to achieve.

Implementation

• The implementation of the Trillium business plan identifies how the resources available to management are to be used to achieve Trillium's mission, goals, and objectives.

Major functional areas within which Trillium's goals & objectives could be framed.

A. Administration
B. Construction
C. Corporate planning
D. Development - real estate
E. Fee (& perhaps internal) services
F. Marketing & sales
G. Training & education

Trillium Company Model

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Issue #1 - 1/3/89
Issue #2 - 12/12/90
Issue #3 - 11/24/95
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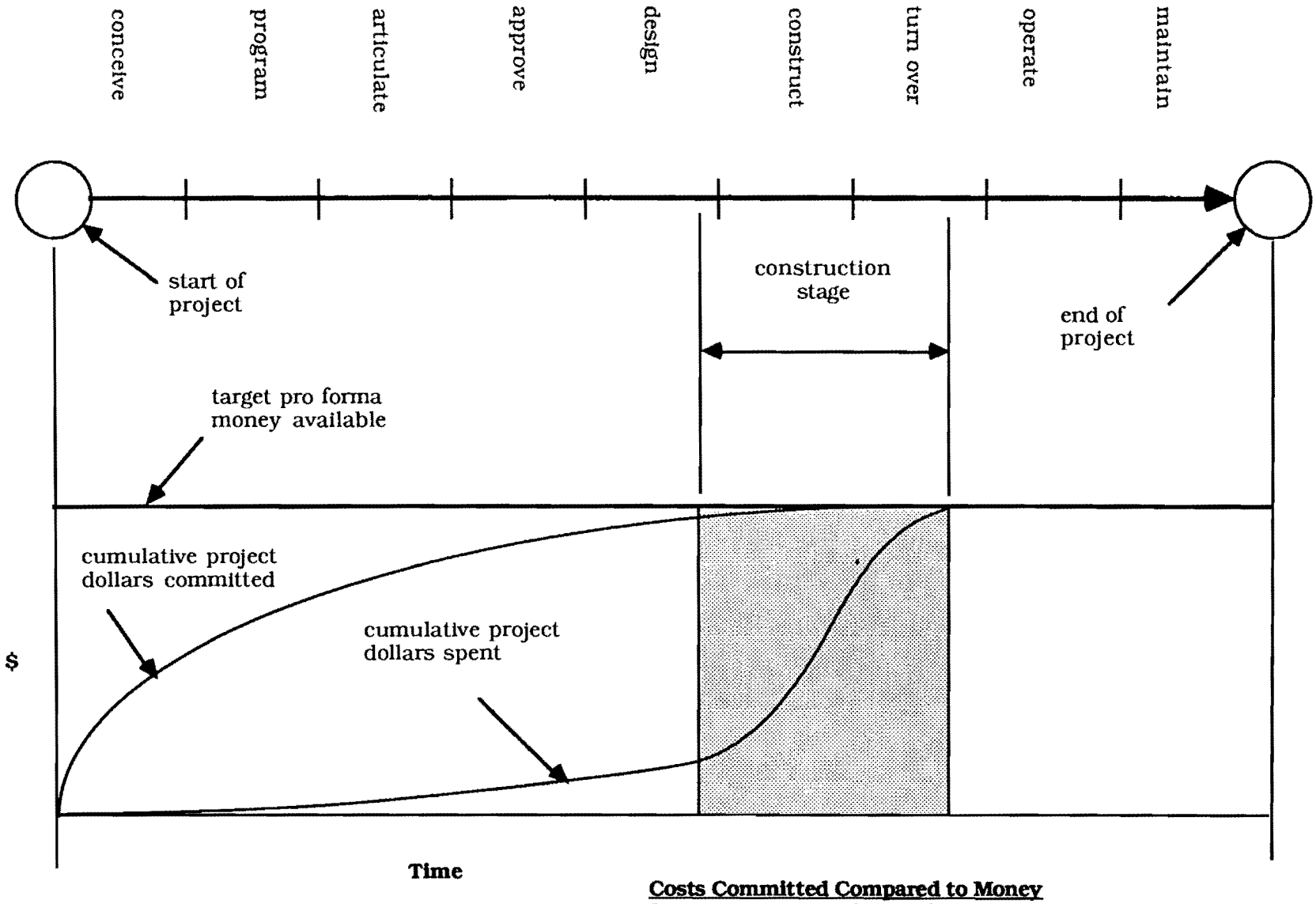

Costs Committed Compared to Money Spent on Construction Projects

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OBLIGATIONS

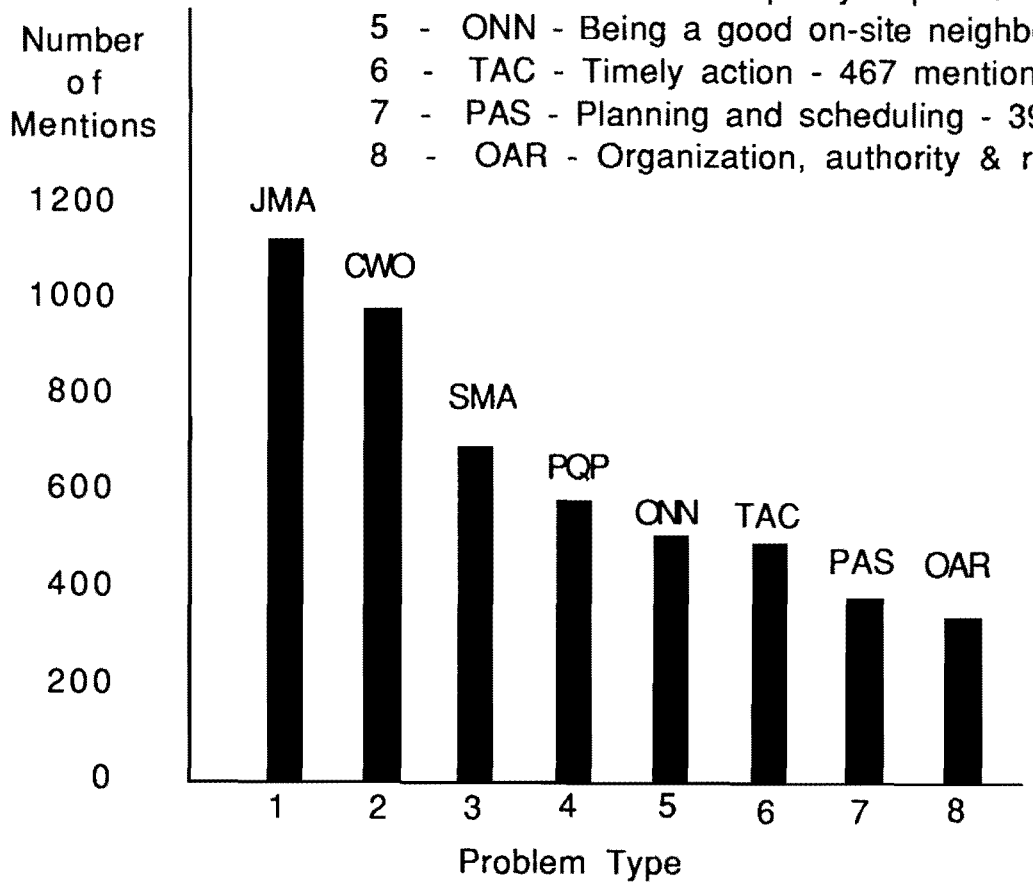
Hierarchy of professional obligations as formulated by Dean Freund

- *Prime - Protection of public health, welfare & safety*
- *Secondary - Your employer or client*
- *Tertiary - Your peers*

- The eight most frequently mentioned design &construction problems. From a total of 2,855 responses to the question "what job difficulties are caused by us and by others?"

Problem Type

1 - JMA - Job management - 1146 mentions
2 - CWO - Communicating with others - 984 mentions
3 - SMA - Staff morale & attitudes - 684 mentions
4 - PQP - Personnel quality & problems - 593 mentions
5 - ONN - Being a good on-site neighbor - 475 mentions
6 - TAC - Timely action - 467 mentions
7 - PAS - Planning and scheduling - 396 mentions
8 - OAR - Organization, authority & responsibility - 371 mentions



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PROBLEM MENTIONS

Total assignments of problem types from 2,855 responses to the questions "What job difficulties are caused by us and by others?" Listed by frequency of appearance.

01. 1146 - Job management.
02. 0984 - Communicating with others.
03. 0684 - Staff morale and attitudes.
04. 0593 - Personnel quality and problems.
05. 0475 - Being a good on-site neighbor.
06. 0467 -Timely action.
07. 0396 - Planning and scheduling.
08. 0371 - Organization, authority, and responsibility.
09. 0288 - Work site conditions.
10. 0268 - Revision processing.
11. 0267 - Construction document quality.
12. 0233 - Program conditions.
13. 0205 - Submittal processing.
14. 0166 - Issue, conflict, and problem resolution.
15. 0166 - User group interaction.
16. 0145 - Equipment and material problems.
17. 0141 - Documents and documentation.
18. 0133 - Decision making.
19. 0125 - Procurement of materials and equipment.
20. 0116 - Project cost structure.
21. 0112 - Closing out the project.
22. 0097 - Contract interpretation.

23. 0097 - Quality management.
24. 0095 - Payment processing.
25. 0092 - Paper and administrative work.
26. 0090 - Approval processes.
27. 0088 - Being a good off-site neighbor.
28. 0073 - Time growth.
29. 0070 - Policies and procedures.
30. 0069 - Inspecting and testing.
31. 0069 - Staffing and manpower.
32. 0064 - Cost growth.
33. 0058 - Substitutions and alternates.
34. 0052 - Maintaining regular project evaluations.
35. 0052 - Safety.
36. 0049 - Regulatory agency matters.
37. 0022 - Constructibility.
38. 0022 - Training.
39. 0022 - Value engineering.
40. 0014 - Labor conditions.
41. 0014 - Legal matters.
42. 0011 - Backcharges.
43. 0011 - Financial problems.
44. 0010 - Weather conditions.
45. 0005 - Warranty conditions

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OBLIGATIONS & BUSINESS NEEDS

- To profitably produce services & facilities.
- To provide solutions.
- To measure the quality of the process you provide.
- To help manage destructive conflict.
- To encourage early action on potentially damaging events.
- To reduce professional liability costs.

OBLIGATIONS & PROFESSIONAL NEEDS

- The design and construction professional is obliged, above all, to protect the health, welfare and safety of the public.

- The legal professional is obliged, above all, to protect the interest of his or her client. These interests are supposed to be defined by the body of law. Thus the body of law, not the legal professional, is depended upon to protect the health, welfare & safety of the public - relative to the law.

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QUESTIONS TO CONSIDER

Guides to Ethical Decision Making

1. Is my decision legal?

- Does it violate civil law or company policy?

2. Is my decision balanced?

- Is it fair to all concerned in the short and long term situation. Does it avoid sum zero situations?

3. How will my decision make me feel about myself?

- Will it make me proud?
- Will I feel good if it is published in the newspaper?
- Will I feel good if my family finds out about it?

Adapted from "The Power of Ethical Management"
by Kenneth Blanchard & Norman Vincent Peale

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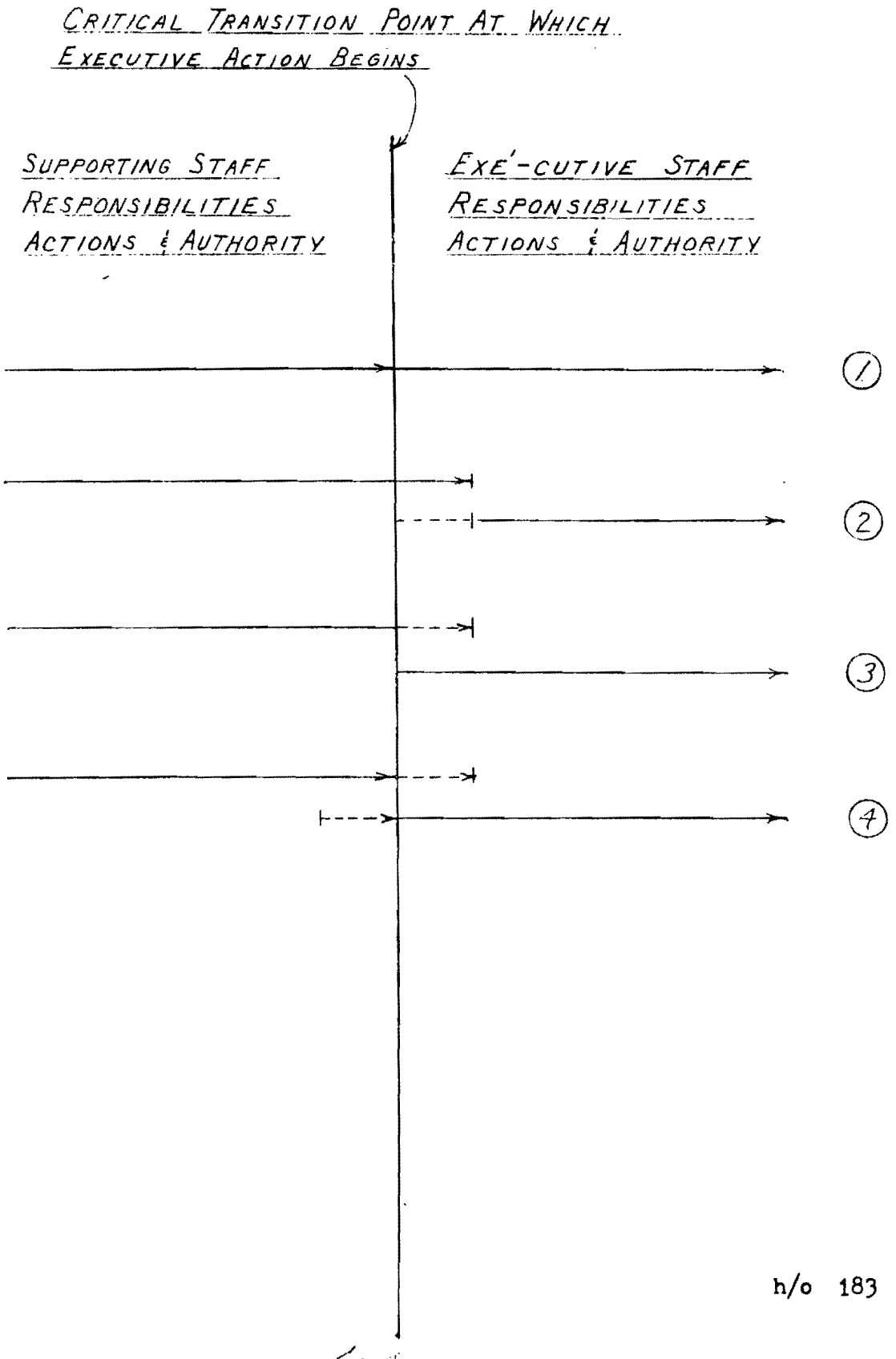

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(1) Line #	(2) Equipment Description & Who Furnishes	(3) Present Location of Equip	(4) Final Location	(5) Action To Be Taken	(6) & By Whom	(7) Other Equip Affected	(8) Remarks
1	2 existing compressed air tanks (Telco)	Existing paint shop	New building paint dept	Relocate	Falstaff	New compressors must be ready to run	
				Set	Young & Falstaff		
				Hook up	Falstaff		
2	3 existing paint spray booths (Telco)	NW corner existing building	New building paint dept	Move & Set	Young	—	
				Hook up	Telco		
A.225 3	2 new paint spray booths (Falstaff)	New	New building paint dept	Erect	Young	—	
				Hook up	Telco		
4	6 existing column mounted jib cranes (Telco)	Cols 6C 5D 7D 3F 4C 2F	New bldg Cols 10A 11A 10B 11B 10C 11C	Remove	Telco	—	
				Move & Instl	Young		
5	2 new prefab shop offices 10'x15'x8' (Young)	New	1 in new bldg lab area 1 in existg bldg QA area	Erect	Young	In existg bldg-after Telco clears space (watch!)	
				Mech/ Elect	Telco		

Abbreviations

NW Northwest
QA Quality Assurance

Equipment Activity Tabulation

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E. Section #5 - How can Michigan architects participate in the currently popular project delivery processes?

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+ **Get Out of That Rut!**
  - **by Gerald D. Hansen, IBEE President**
  - **Life runs smoothly and uneventfully when we follow a regular routine. But when we allow our daily routine to blind us to new ideas or choices, we pay a price. People who make creative breakthroughs are the ones who are continually looking for different ways to do things.**
  + **If you would like to break out of your daily routine, try a few of these rut-busting activities. Below each one, write down one or two new things that you learned or thought of on the day you did the activity.**
    - Speak to someone you see everyday but have never spoken to before.
    - Rearrange your work area.
    - Take a different route to work in the morning.
    - Part your hair on the other side.
    - Sign up for an activity you have never done before.
    - Use your left hand if you're right-handed, or right hand if you're left-handed, for one day.
    - Pretend you're a photographer. For one day, look at your surroundings as opportunities for unusual photographs.
    - Read a novel, except the last chapter. Then write your own ending.
    - Eat lunch in a different place, with a different person. Order something have never eaten before.
    - Draw something you see every day. Don't worry about how good the drawing looks, but how you "see" the object.
    - Read a book on a subject you know nothing about.
    - Pretend it is your first day at work. What are your reactions?
    - Find a new use for an object commonly found in your work area.

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Risk - its nature & managment in the construction profession - ho 440

I. **Definitions**
   A. ***Conflict***
      A state of disagreement and disharmony.
   B. ***Destructive conflict***
      Animosity or disagreement which results in lowering the potential for an individual or organization to succeed.
   C. ***Positive conflict***
      Hostility that is managed so its resolution raises the potential for well intentioned individuals or organizations to succeed at being excellent.
   D. ***Responsibility***
      The assignment, spoken or understood, that a person in an organization has as their part in maintaining the organization's health and vitality.
   E. ***Risk***
      Any exposure to the possibility of harm, danger, loss or damage to people, property, or other interest. To expose to a chance of loss or damage.

II. **Why are disputes often not resolved promptly and fairly.**
   A. Differences in goals and objectives of parties to the project.
   B. Greed.
   C. Improper assignment of risk.

III. **Some actions entailing risk in the planning, design, and construction profession.**
   A. Approval processes.
   B. Being a good neighbor.
   C. Closing out a project.
   D. Communicating with others.
   E. Maintaining constructibility of a project.
   F. Maintaining construction document quality.
   G. Managing cost growth.
   H. Maintaining a good work site.
   I. Keeping job morale & attitudes healthy.
   J. Managing and resolving legal matters.
   K. Paper and administrative work.
   L. Payments.
   M. Planning and scheduling the work.
   N. Setting and maintaining policies and procedures.
   O. Processing revisions.
   P. Material and equipment procurement.
   Q. Maintaining integrity of the design and engineering program.
   R. Establishing a profitable cost structure.
   S. Managing quality.
   T. Processing submittals.
   U. Controlling time growth.

IV. **How to recognize risk on a project (adapted from Mr. Papageorge, R. A.'s comments on risk)**
   A. Identify as many potential threats to project success as early as possible.
   B. Identify where problems will be caused by taking risks to help assure project success.
   C. Evaluate and analyze the project team's ability to take the risks identified.
   D. Evaluate and analyze the project team member's abilities to take the needed risks.

date printed: March 21, 2000

E. Identify the impact of legal contractual obligations on the risks being considered.
F. Evaluate and analyze existing project conditions and the restraints they exert on the project.
G. Establish and implement a systematic procedure for identifying and adjusting risk to acceptable levels to assure a high probability of project success.

V. **Helpful hints to effectively manage risk in construction**
A. Start the job at the right time.
B. Profile the job before committing resources.
C. Always remember - good management is risk control.
D. Don't lose your personal intellectual grasp of risk on your job.
E. To manage risk correctly, read the documents.
F. Evaluate the quality of the total contract documents.
G. Be certain to obtain and read all pertinent contract documents.
H. Match your price to the project delivery system being used.
I. Avoid being made a limited agent on a hard money job.
J. Avoid over-the-wall management.
K. Keep abreast and aware of current industry trends, particularly organizational patterns.
L. Be aware of your client's must, want, and wish list, and respect them.
M. Understand and account for other project participant's profit needs and desires.
N. Don't hesitate to scrub your proposal if the risk is excessive relative to the rewards.

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An Overview of Partnering

I. Definitions

A. *Critical Transition Point*
The point in a project delivery system at which the responsibility and authority for the work passes from the supportive group to the ex'e'cutive group.

B. *External project challenges*
Challenges to the functional or project integrity by those outside the parent organization that seek change or disruption.

C. *Functional component*
A group designed or adapted to perform some specialized activity or duties, usually concerned with the continuous operation of the company.

D. *Internal functional or project challenges*
Challenges to the functional or project integrity by those within the parent organization that seek change or disruption.

E. *Partnering*
A method of conducting business in the planning, design, and construction profession without the need for unnecessary, excessive and/or debilitating external party involvement.

F. *Partnering charter*
The basic manual for operating a partnering system. Contains at a minimum, the mission of the project team, and their objectives for the project. Usually is signed by those writing the document.

The charter is an agreement in principle and must not supersede or supplant the design and construction contracts in place or to be written.

G. *Project component.*
Project - as related to management
A group established to achieve a set of objectives by accomplishing a set of related, discrete operations which have a defined beginning & end.

H. *Relations - Formal Functional*
Organizational connections that concern distribution and use of data, information and decisions that flow along formally defined transmission lines. Formal functional communications are usually written and are normally both from and to individuals and groups.

Formal relations are precisely defined and most day to day business is accomplished within the formal relation framework. The line expressing a formal functional relation usually has an arrowhead at each end to show a mutual exchange of responsibility and authority. If there is a higher authority to be implied a single arrowhead can be used pointing to the superior party.

I. *Relations - Informal*
The natural channels along which organizationally related material is most easily and comfortably transmitted. The informal relation exists by mutual consent of the parties to the relation, and is stimulated to maximum effectiveness by a mutual profit gained from the relation.

Little, if any, authority normally is expressed in informal relations. Communications are usually oral and one to one. Often informal relations define the hidden organization structure. A line defining an informal relation is usually shown dotted with an arrowhead at each end.

J. *Relations - Reporting*
The official channels through which each individual conveys, or is given raises, appraisals and evaluations; is fired, assigned or is provided professional, vocational and personal identity in the organization. The true organizational superior of an employee is usually that individual with whom he maintains a reporting relation. The line expressing reporting relations has an arrowhead at one end pointing to the superior.

K. *Relations - Staff*
The business patterns through which a person or group provides consulting services necessary to achieve goals and objectives. Staff personnel usually have little or no authority over those outside the staff group. The line expressing staff relations has an arrowhead at each end.

L. *Relations - Temporary*
Those relations created when extraordinary or unusual management demands must be met. The temporary relation is usually unstable and should be kept active for only short periods of time. The line expressing a temporary relation can have an arrowhead at one or both ends depending on the nature of the relations.

Extensive use of temporary relations creates business dysfunctions, breaks down morale and causes internal tensions.

M. *Stakeholder*
An at-risk member of the charter writing team who has signed the charter.

II. **Project contract components**
  A. **Agreement premises**
  B. **Authority limits**
  C. **Payment methods**
  D. **Scope of services**

III. **Project organization components**
  A. **Relationships**
    1. **Formal**
    2. **Informal**
    3. **Reporting**
    4. **Staff**
    5. **Temporary**
  B. **Functional components**
  C. **Project components**
  D. **Authority**
  E. **Responsibility**
  F. **Internal project challenges**
  G. **External project challenges**

IV. **Partnering is a system of conducting business with minimal destructive conflict. Other names for partnering are:**
  A. **A handshake agreement.**
  B. **A gentleman's agreement.**
  C. **"Let's look at the drawings a bit more closely."**
  D. **"Let's tally up the favor score?"**
  E. **"Let's settle this over a beer."**

V. **Why is partnering applicable in today's construction industry?**
  A. **What value is added by partnering?**
    1. **Lower costs to resolve conflicts.**

2. **Quicker settlement of conflicts.**
3. **Knowledgeable professionals make the resolution decisions.**
4. **Decision makers are closer to the resolution process.**
5. **Nature of decisions rendered lessen the probability of appeal.**
6. **Participants gain privacy in the resolution process.**
7. **Probability of fair resolution is increased by timely consideration of the dispute.**
8. **Helps cross critical transition points by setting the ground rules for the crossing.**

B. **Where and why has partnering been successful?**

1. **Comments on partnering from the Albuquerque District Corps of Engineers staff in a guide to partnering dated February, 1991.**

   "Our experience is positive based on six contracts with four of them substantially complete." Benefits include:

   a) Disputes reduced - no formal claims.
   b) Common objectives achieved (schedule, safety, etc.).
   c) Increased responsiveness.
   d) Higher trust levels.
   e) Improved communication.
   f) Excellent cooperation & teamwork.
   g) Increased value engineering proposals.
   h) Developed expedited process for tracking and resolving open items.

2. **Comments on partnering by Colonel Charles E. Cowen - Commander Portland District Corps of Engineers in a strategy for partnering in the public sector - April 15, 1991.**
   a) 80 to 100 % reduction in cost growth over the life of major contracts.
   b) Time growth in schedules virtually eliminated.
   c) Paper work reduced by 66%.
   d) All project engineering goals met or exceeded.
   e) Completion with no outstanding claims or litigation.
   f) Safety records significantly improved.
   g) Pleasure put back in the process for all participants.

3. **Combination partnering relationships surveyed & studied by the Construction Industry Institute and reported in the publication ("In Search of Partnering Excellence" - July 1991).**
   a) Shell Oil/SIP Engineering - 1984.
   b) DuPont/Fluor Daniel - 1986.
   c) Proctor & Gamble/Fluor Daniel - 1986.
   d) Proctor & Gamble/BGP - 1986.
   e) Shell Oil/Bechtel - 1987.
   f) DuPont/MK - Ferguson - 1987.
   g) Shell Oil/The Ralph M. Parsons Company - 1987.
   h) Alcan/Fluor Daniel - 1988.
   i) Union Carbide/Bechtel - 1988.
   j) DuPont/Day & Zimmerman - 1988.
   k) Great Northern Nekoosa/Rust International - 1988.
   l) Pillsbury/Fluor Daniel - 1989.
   m) Hoffman-LaRoche/Day & Zimmerman - 1989.
   n) Chevron/Bechtel - 1989.

o) Bethlehem Steel/United Engineers & Constructors - 1989.
p) Proctor & Gamble/M. W. Kellogg - 1989.
q) Chevron/Besteel - 1990.
r) DuPont/H. B. Zachry.

C. Situations in which partnering may be difficult to use.
1. Where the parties intend to pay lip service only to the partnering effort.
2. Where individuals in key technical or management positions choose to resist intelligent discussion and fair decision making.
3. Where early commitments by the owner have made made good intercontract relationships difficult or impossible to maintain.
4. Where construction contracts are let as the documents are being released for field use.
5. Where several parties to the contract prefer to resolve disputes by contested claiming & binding resolution.
6. Where poor contract documents are made the basis of the partnering effort.
7. Where excessive, one sided conditions are placed on sub contractors by prime contractors.
8. Where unfair or obscure payment processing systems are specified and enforced.
9. Where risk has been poorly defined and unfairly allocated.

VI. What are some of the action ingredients of a successful partnering effort?
A. Generate and maintain a strong desire to achieve project success for all.
B. Make intelligent commitments.
C. Avoid accepting or imposing unreasonable risk.
D. Work and act ethically, morally, and with integrity.
E. Work and act from a position of fairness rather than a position of power.
F. Suppress greed.
G. Try to establish an honest feeling of trust among participants.
H. Gain support from the participants and stakeholders.
I. Assign experience, competent people to responsible management positions.
J. Have empathy.
K. Prepare a good charter, a good partnership evaluation system, and a good issue resolution process.
L. Allow time to make the partnering system work.
M. Recognize and celebrate success.
N. Gain the support and participation of higher management.
O. Develop and use guidelines and evaluation systems for measuring performance quality.

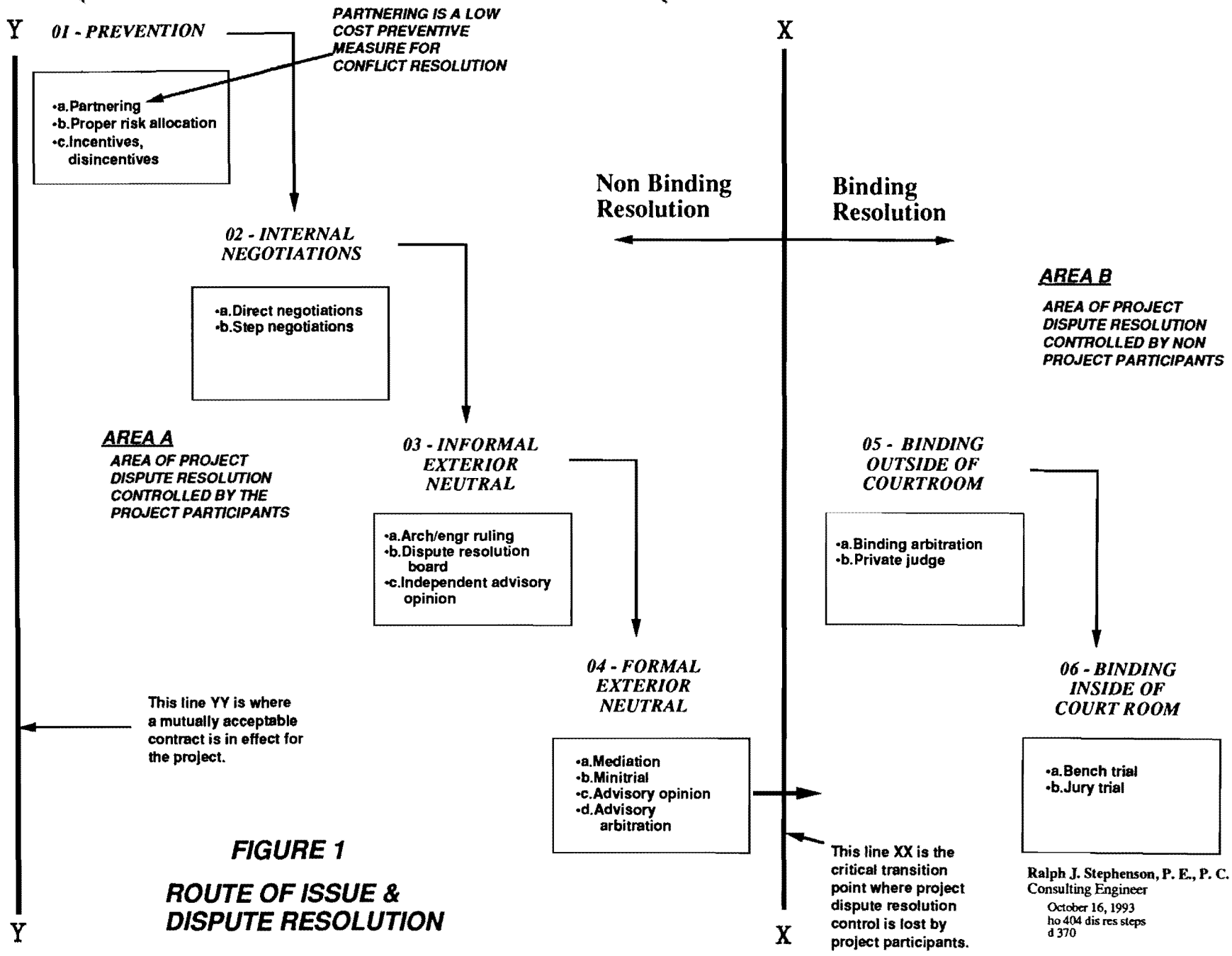

FIGURE 1

ROUTE OF ISSUE & DISPUTE RESOLUTION

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October 16, 1993
ho 404 dis res steps
d 370

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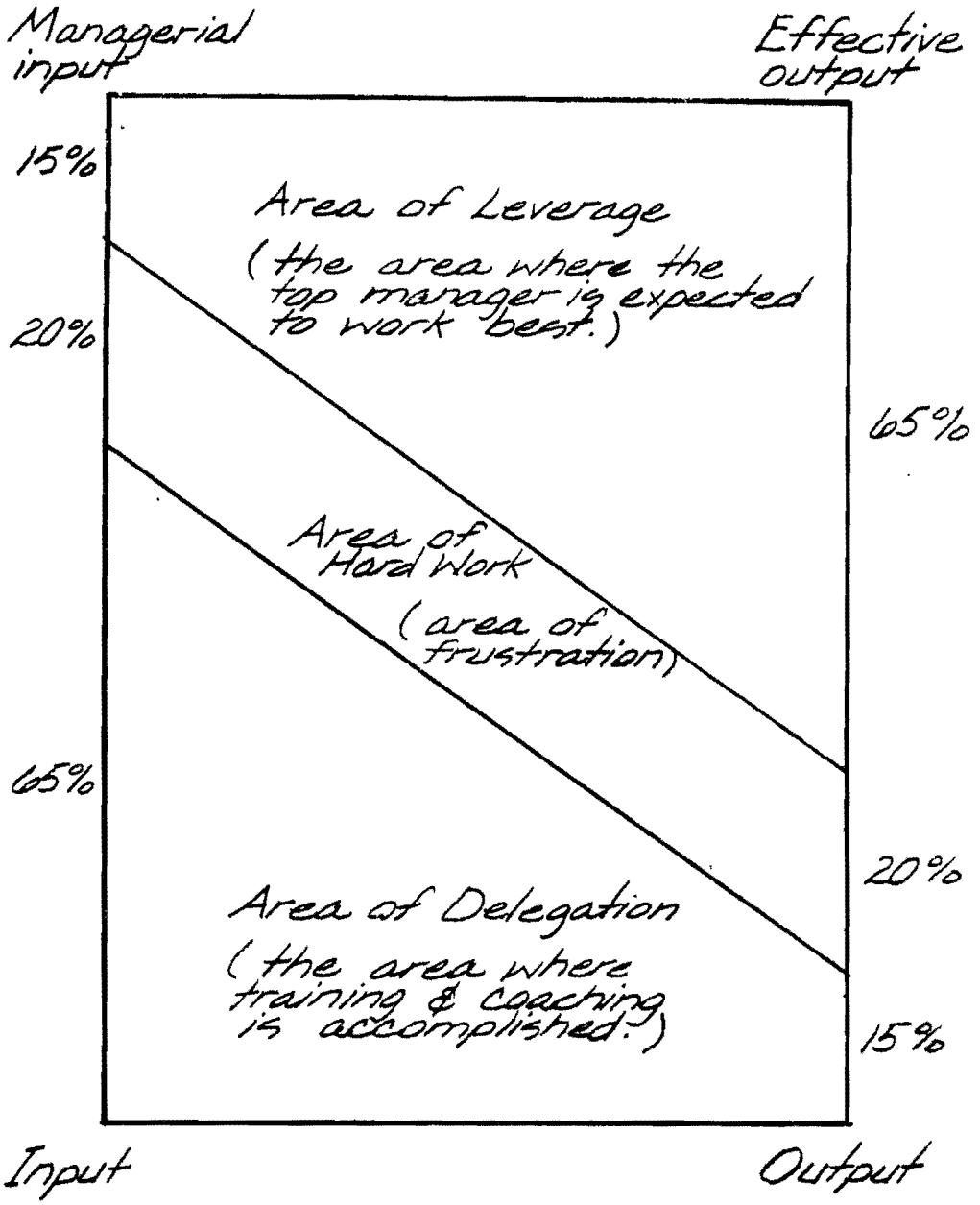

MANAGERIAL LEVERAGE

HO 210

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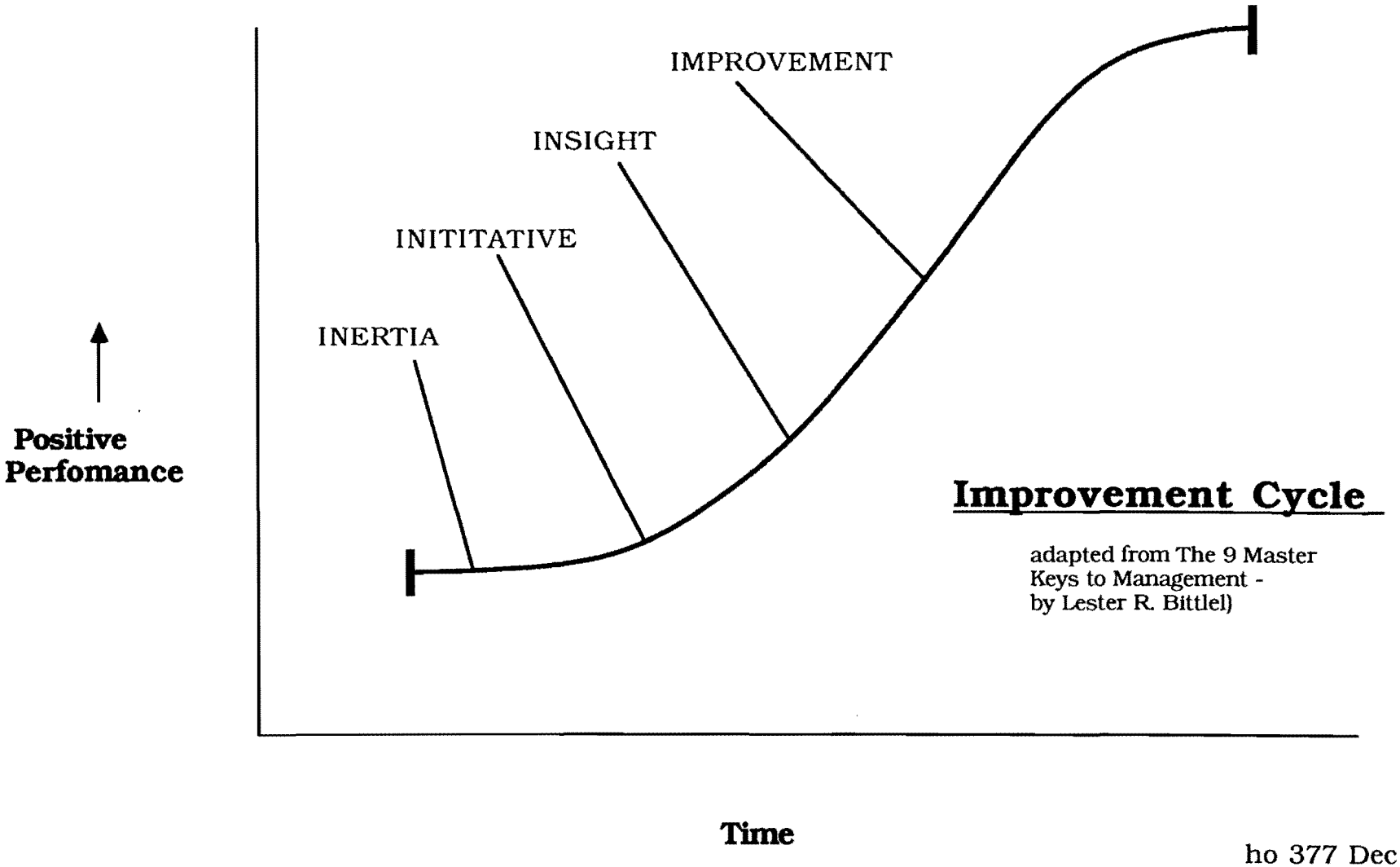

Improvement Cycle

adapted from The 9 Master Keys to Management - by Lester R. Bittlel)

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- ## The Project Program - summary outline
  - ### Definition of a project program
    A narrative oriented statement of the needs and character of the proposed user operation, the requirements of the user and owner, the nature of the environment to be planned, designed and built, and the corresponding characteristics of the space that will satisfy these needs and requirements. Sometimes called the brief.

  - ### Contents of the project program - listed alphabetically
    The program for facility work contains specific information about the following items. For special uses the list below should be expanded to accommodate the unique needs of the facility.

1. **Addresses, and phone and fax numbers of key people.**
2. **Advertising needs.**
3. **Aesthetic needs.**
4. **Backup needs**
5. **Codes and ordinances applicable.**
6. **Communication needs.**
7. **Community needs.**
8. **Cost goals - pro forma**
   A financial model unusually built early in a design and construction program to show by projecting income and expenses, how the money flow to and from the project will occur. It is often used to establish the capital amount to be allocated to a project based on simulated operating conditions. The term pro forma means according to form.

9. **Dimensional needs - horizontal and vertical**
10. **Employee facilities and amenities**
11. **Expansion needs.**
12. **Functional needs - what design will make the project behave the way it is supposed to when it is built and in operation?**
13. **Handicapped needs.**
14. **Heating and air conditioning needs.**
15. **Horizontal transportation needs.**
16. **Lighting needs.**
17. **Location of project.**
18. **Logistical needs**
    Logistics - The design and implementation of operations that deal with the procurement, distribution, maintenance, and replacement of material and personnel.

19. **Name of project.**
20. **Nature of the project - what is it supposed to do when it is built and in operation?**
21. **Parking needs.**
22. **Participants - specifically, who are they now and in the future?**
    1. Conceivers
       Those who conceive the idea and provide the wherewithal to bring the environmental program to a successful conclusion. The conceiver may be the owner but it might also be a governmental agency, a financial source, an architect, an engineer, a contractor, a

vendor or a potential tenant looking for space. We identify the conceiver since he usually is the key person driving the project on to completion.

2. Translators
   Those who translate the environmental program into construction language. Traditionally we think of the architect/engineer as the translator. However careful consideration of this matter shows there are many others who translate the conceiver's fundamental ideas into understandable, workable construction language. Subcontractors, suppliers, vendors, manufacturers, contractors, and the conceiver may all play a role in translating.
3. Constructors
   Those who interpret the construction language and convert it to an actual physical environment. Occupying this role are general contractors, specialty contractors, vendors, suppliers, manufacturers, artists and others who actually put the materials into place in the field.
4. Operators
   Those who operate and maintain the completed physical environment on a continuing basis. Usually the party responsible for this function is an owner or tenant working through a plant or facilities manager.
5. Regulators
   Those who fill a review & inspection position to help insure protection of the health, safety, & welfare of the people. This is usually done by enforcing regulations written and adopted by qualified public or private bodies. Examples of regulators include those who work for building departments, departments of natural resources, public health agencies, fire prevention organizations, technical societies and other such groups.
6. Users
   Those who use the facility either directly or remotely. Direct use is permanent or temporary occupancy of the facility. Indirect use is any interface with the building's occupants that is conducted from a location other than at the facility.

23. **Personnel special needs.**
24. **Plumbing needs.**
25. **Power needs.**
26. **Project delivery systems to be considered.**
    A method of assembling, grouping, organizing & managing project resources so as to best achieve project goals & objectives.
27. **Public transportation needs.**
28. **Receiving needs.**
29. **Recreational needs.**
30. **Security needs**
31. **Shipping needs.**
32. **Special hazards and environmental problems.**
33. **Stand by needs.**
34. **Storage needs.**
35. **Structural needs.**
36. **Surveillance needs**
37. **Trash disposal and recycling needs.**
38. **Vertical transportation needs.**

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Partnering Charter Objectives

The list of objectives below is designed to assist the stakeholders to write a sound, well expressed charter. If a numbered objective fits a particular recommendation your team wishes to make, note the number of the objective and any revisions you wish to make to it. We will then consider the objective for inclusion as we write the project charter.

Major topics appearing below include:

A. Approval Processes
B. Being A Good Off/On Site Neighbor
C. Closing Out the Project
D. Communicating With Others
E. Decision Making
F. Documents and Documentation
G. Financial Matters
H. Inspection and Testing
I. Issue, Conflict, and Problem Resolution
J. Job Management
K. Legal Matters
L. Maintaining Regular Project Evaluations
M. Organization, Authority, and Responsibility
N. Planning and Scheduling
O. Payment Processing
P. Personnel Quality and Problems
Q. Regulatory Agency Matters
R. Revision Processing
S. Staff Morale and Attitudes
T. Submittal Processing
U. Work-site Conditions

Don't hesitate to change wordings since it is entirely possible that your expression of a desired objective may be different than that of the original.

A. Approval Processes

1. Provide required documentation and approvals within the mutually agreed upon time frame.
2. Make and document all decisions, and provide all approvals at their

management level promptly, fairly and with consideration of the requirements of the project.

B. Being A Good Off/On Site Neighbor

3. Maintain a clean, safe, accessible , and well-planned work site.
4. Recognize that project conditions and decisions affect other partners in achieving the overall design intent.
5. Maintain, in conjunction with other stakeholders, a work area plan to be implemented by affected stakeholders.

C. Closing Out the Project

6. Establish close-out guidelines that provide clearly understood direction for punching out the job, issuing Certificates of Substantial Completion, establishing intermediate occupancy dates, and maintaining and transmitting contract record documents.
7. Prepare and specify a close out plan.
8. Prepare and specify a rolling punch list and close out procedure.
9. Establish and implement guidelines that provide direction for accepting the work and closing out the job.
10. Do it right the first time and strive to achieve a minimal punch list.

D. Communicating With Others

11. Prepare, publish, keep current and respect a chart of channels of communication, responsibility, and authority.
12. Limit the release of public information through the owner's designated representative only.
13. Anticipate, identify, and accurately communicate potential job problems.
14. Ask questions and request information clearly and accurately
15. Be sensitive to the informational needs of the design and construction team partners.
16. Communicate all issues in a timely fashion to all those affected by the issues.
17. Communicate clearly, accurately and in a timely manner through appropriate project channels.
18. Communicate effectively in an open, honest manner with all appropriate stakeholders.
19. Anticipate and communicate the conditions and disruptive circumstances inherent in demolition and construction activities, to the staffs of the various facilities that are a part of this total program.

20. Communicate the principles of partnering on this project to all participating organizations and individuals.
21. Identify planned and required shut downs, and outages from and to the designers, builders, and the Capitol Complex operations staffs.
22. Ensure the design is understood and acknowledged by all the partners.
23. Maintain open lines of communication.
24. Make progress and technical meetings productive and brief by preparing well, and bringing both problems and solutions to the table.
25. Prepare and publish a communications flow chart showing roles and responsibilities of all project team members.
26. Prepare well for progress meetings and make them brief and productive.
27. Promptly prepare and respond to requests for information, substitutions, and clarifications of project documents.
28. Provide adequate data re: user-furnished equipment for construction to proceed as desired.
29. Provide timely communications, responses, decisions... and be available.
30. Recognize that project conditions and decisions affect other partners in achieving the overall design intent.
31. Regularly monitor and discuss, all anticipated outages with utility company and subcontractor input and provide maximum possible notice to the user of anticipated outages.
32. Respond promptly to requests for information and clarifications of contract documents.
33. Stay in touch with the project, i.e. reading meeting minutes, attending meetings as needed, and being available for input.
34. Prepare, publish and adhere to the lines of communication, authority, and responsibility for the school building partnering team.
35. Prepare and respond promptly and completely to requests for information and clarification of contract documents.

E. Decision Making

36. Make decisions in a timely manner and stand by the agreements you have made.
37. Make timely decisions in all project related matters.
38. Provide adequate backup data, within expectations, to allow timely and accurate decisions to be made by members of the project team.
39. Recognize that project conditions and decisions affect other partners in achieving the overall design intent.

F. Documents and Documentation

40. Accurately prepare and properly distribute project documentation in a timely manner.

G. Financial Matters

41. Practice fairness in price proposals, backcharges, and all other financial matters.

H. Inspection and Testing

42. Provide for timely and professional technical inspection services with appropriate documentation and feedback to those affected.

I. Issue, Conflict, and Problem Resolution

43. Maintain the current issue resolution policy. (The current policy stresses the resolution of conflict at the originating or lowest possible working level.)
44. Minimize disputes and resolve conflicts quickly and at the lowest possible management level.
45. Prepare and publish an issue resolution policy which stresses the timely resolution of conflict at the originating or lowest possible management level and seeks to avoid litigation.
46. Prepare, publish, and implement a dispute resolution system designed to resolve conflicts at the lowest possible management level.
47. Strive to resolve job conflicts quickly and at the originating or lowest possible level.

J. Job Management

48. Anticipate events - be proactive.
49. Avoid surprises!
50. Be familiar with the contract documents.
51. Carefully evaluate and be sensitive to the impact that construction activities may have on the environmental integrity and safety of all ongoing hospital operations.
52. Continue to implement the partnering evaluation system (involving new participants).
53. Continue to improve and implement agreed-upon project procedures that provide all stakeholders guidelines for:
54. Time commitments for procedures.

55. Prioritizing assignments.
56. Design and construct a facility that is built so as to recognize the need for the builders and the designers to achieve a reasonable financial profit on their work.
57. Design and construct a facility that is built within the time and cost terms of the lease-purchase documents.
58. Develop a organizational matrix showing lines of communication and responsibility to be maintained on the project.
59. Encourage the participation of all parties at all project levels in the partnering process and the partnering spirit.
60. Enforce the construction traffic and parking plans.
61. Foster understanding of construction documents
62. Identify and remedy incorrect performance in a timely manner.
63. Insure that each of their management team members is fully aware of the requirements of the project.
64. Keep current with project status and requirements.
65. Keep paperwork to a minimum.
66. Maintain a close relationship between expectations and reality
67. Maintain a continuous and efficient work force and effective procurement to ensure quality, sequence, and schedule
68. Maintain an adequate management and work force to fulfill contract commitments.
69. Maintain client safety and user satisfaction during construction.
70. No surprises
71. Plan for and meet the human resource requirements of the project, and maximize opportunities for women and minorities.
72. Plan for future service access to equipment during mechanical, electrical and plumbing installation.
73. Plan for the future not for the past.
74. Prepare and publish a calendar of project events indicating when key personnel are required to participate in project management activities. Partners will attend and participate in all required meetings and provide backup management where necessary.
75. Preplan work recognizing the impact plans have on achieving the design intent.
76. Properly staff and maintain competent personnel, and equipment required on the project.
77. Provide proper resources to support the agreed-upon plan and schedule of work.
78. Provide resources to fulfill contract & charter obligations.
79. Recognize and be sensitive to the needs of other stakeholders on the project.
80. Strive for a zero punch list.

81. Use human and technological resources to their maximum effectiveness.
82. Meet individual and organizational obligations.
83. Maintain a clean, safe, accessible and well-planned job site.
84. Maintain a clean, secure, accessible and well-planned job site.
85. Work to improve submittal and request for information (rfi) processing, including agreed-upon schedules and response times to meet the needs of all parties.
86. Work to maintain prompt payment processing including retention.
87. Work to improve revision and change order processing, including a streamlined process for minor changes ($1000 or less).

K. Legal Matters

88. Strive to avoid litigation.
89. No litigation.

L. Maintaining Regular Project Evaluations

90. Prepare, publish, and implement a partnering evaluation system by which the effectiveness of the system is regularly monitored. (stakeholders task force)
91. Prepare, publish and implement a project partnering evaluation system.

M. Organization, Authority and Responsibility

92. Be accountable for your actions.
93. Fulfill respective responsibilities and commitments to permit on-time completion of the project.
94. Maintain continuity of key job personnel.
95. Prepare and publish a project directory showing people, work category, position and alternate contact.
96. Prepare, publish, and use a project chain of command
97. Prepare, publish, and keep current a chart of channels for communication, responsibility, and authority.

N. Planning and Scheduling

98. Adhere to agreed upon schedules and resource commitments.
99. Adhere to the current master construction schedule in effect on the project.
100. Develop a realistic plan of work and project schedule and honor it.
101. Distribute and regularly monitor and discuss, with subcontractor input, a master project schedule, and update schedules as required.

102. Mutually prepare, publish, implement, and keep current a project action plan and schedule of work that is useful to all stakeholders.
103. Prepare, distribute and regularly monitor and discuss, with subcontractor input, a master project schedule, and update schedule as required.
104. Solicit all team member's input for planning and scheduling

O. Payment Processing

105. Promptly prepare, submit, and process all payment requests.
106. Submit properly prepared requests for payment.

P. Personnel Quality and Problems

107. Do it right the first time and strive to achieve a zero punch list.
108. Prepare, publish, promote, and adhere to standards of work place conduct.

Q. Regulatory Agency Matters

109. Work closely with all regulatory agencies to assure compliance to their current standards and regulations.

R. Revision Processing

110. Accurately price changes to the project in a timely, reasonable and fair manner.
111. Approve and process changes in a timely manner.
112. Approve changes in a timely manner including formal issuance of supplemental agreements.
113. Control revisions being considered for the project to maintain the planned budget.
114. Prepare and implement guidelines for screening proposed changes to the project prior to requesting formal pricing of the changes. (owner, user, designers)
115. Provide accurate data and adequate time to ensure pricing changes that are fair and timely.
116. Provide reasonable change request budgets and identify insufficient budgets promptly.
117. Provide reasonable field change orders and change issue budgets, and accurately price changes to the project in a timely, reasonable, and fair manner.

S. Staff Morale and Attitudes

118. Be available.
119. Be cooperative.
120. Be willing to suggest and consider cost and time effective options.
121. Establish a trustful work environment with other stakeholders.
122. Establish and maintain good informal working relations on the job.
123. Extend the spirit of partnering to all project participants.
124. Have fun!
125. Have fun and celebrate the successful completion of the project.
126. Maintain high job morale and cooperative attitudes among all project participants.
127. Make the project a fun place to work and to meet new friends.
128. Promote and adhere to acceptable standards of conduct by the project team on the site.
129. Recognize individual and team accomplishments.
130. Respect all project participants and their work.
131. Respect and treat other's and their work as you wish you and your work to be treated; accept responsibility for damage to other's work.
132. Respect design and construction excellence as a fundamental goal to be achieved.
133. Respect financial profit as an incentive for private sector stakeholders.
134. Respect other team members' work and abilities.
135. Take pride in our work, respect the ideas and work of others and treat others as you would have them treat you.
136. Treat others as you would have them treat you.
137. Practice fairness in price proposals, back charges, and all other financial matters.

T. Submittal Processing

138. Prepare, package, and process submittals in a timely, fair, and considerate manner consistent with the priorities of the contractors, designers, and owner.
139. Promptly review and determine the merit of properly submitted requests for extensions of time.

U. Work-site Conditions

140. Continue to maintain continuity of work points between trades. (Work points refer to building control coordinates and elevations.)
141. Maintain a safe, orderly, well organized work site.
142. Maintain a well planned and clean work site.
143. Maintain continuity of work points between trades.

144. Maintain, in conjunction with other stakeholders, a work area plan to be implemented by affected stakeholders.
145. Prepare and publish a construction traffic and parking plan.
146. Prepare, publish, and implement a project clean up program for contractors on site.
147. Promote a clean and safe job environment.
148. Provide complete and unencumbered access to needed work areas in accordance with the project schedule.
149. Respect and treat others and their work as you wish you and your work to be treated. Take responsibility for damage to other's work. Amen!

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Eight actions to smooth out and resolve potentially destructive conflict

Action #1 Understand the cause of the conflict.

Action #2 Put yourself in the other person's shoes.

Action #3 Understand the relative importance of resolution versus nonresolution.

Action #4 Communicate openly and clearly

Action #5 Become competent in the proper application of the technical and professional tools of the design and construction profession.

Action #6 Thoroughly understand the obligations you have to society and to your clients, your employer, and your peers.

Action #7 Understand everything you can about your responsibilities - and work to be effective in managing intersections of diverse interests.

Action #8 Clearly document the conditions under which the conflict is resolved.

ho 498 July 1998

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Plant Engineering Retainer Services (PERS)

Many manufacturing plants cannot afford to maintain a full-time plant engineering staff. In small industries particularly, the day-to-day engineering and planning problems are solved on the basis of what is most expedient with the limited technical knowledge available. Changes in plant layout, alterations to the mechanical, electrical, or structural systems; expansion planning; and other like items are oftentimes inadequately conceived and planned, insufficiently recorded, and uneconomically carried out.

The reasons for this are apparent. First, it is rare that the single plant engineer or the small maintenance crew has enough collective experience to successfully handle all technical problems that arise in the continuous manufacturing operation. Second, it is expensive to build a well-rounded engineering staff, and most plants cannot afford the resulting overhead and burden. Further, work demands upon the small plant engineering staff are unpredictable. A peak load today requiring four or five technicians may diminish next week to a load requiring none.

The participation of a consulting engineering/architectural/planning firm in plant engineering matters can be invaluable to management. Most industrial executives call upon the consultant only when a new building is to be erected, a planned rehabilitation is under consideration, or a new piece of equipment is to be selected. However, the consultant can perform an equally great service to the owner or his staff by participating in the week-to-week, month-to-month operation of the plant.

By utilizing the consultant's professional services on a continuous retainer basis, management can bring to bear upon their short-term problems the same careful, competent attention that is given major building and equipment replacement programs. By making its full depth of staff experience available on immediate notice, the consultant firm can apply the talents of expert specialists to whatever problems might arise in its clients' plants.

Management, thus, has available, on call, a plant engineering department familiar with the installation, fully qualified to perform technical services, and containing personnel with experience over an industry-wide area of application.

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Budgeting terms

I. Proforma - in real estate development

A financial model unusually built early in a construction program to show by projecting income and expenses, how the money flow to and from the project will occur. It is often used to establish the capital amount to be allocated to a project based on simulated operating conditions. The term pro forma means according to form.

II. Program - as defining a step in the design process

A narrative oriented statement of the needs and character of the proposed user operation, the requirements of the user and owner, the nature of the environment to be planned, designed and built, and the corresponding characteristics of the space that will satisfy these needs and requirements. Sometimes called the brief.

III. Program - as defining a generic construction effort

A major planning, design, construction, and operational construction effort made up of several projects.

IV. Must list

Items that must be included in the scope of work to make the project a go. If any of the items in the must list are not able to be included the project is a no-go.

V. Want list

Items that are wanted and can be included in the scope of work, over and above the must list items, since they provide a definable and acceptable rate of return on their cost.

VI. Wish list

Items that the owner and the user wish they could include but might not be able to due to budgetary or other reasons. Wish list items are best added, not deleted, as the project moves into construction.

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About Ralph J. Stephenson, P.E.

Ralph J. Stephenson, P.E., is an engineering consultant who has a diversified background in land planning , facilities location, building design, and construction.

Mr. Stephenson earned degrees at Lawrence Institute of Technology (Bachelor of Science, Mechanical Engineering), and Michigan State University (Master of Science, Civil Engineering). He has been associated with such firms as Smith, Hinchman, and Grylls, Victor Gruen Associates, Benjamin Schulz Associates, and the H. F. Campbell Company. With the latter three organizations Mr. Stephenson occupied executive positions as vice president. In 1962 he started his own consulting practice, specializing primarily in providing operational and management direction to owners, designers, and contracting firms.

He is a registered professional engineer in Michigan, Wisconsin, Illinois, Indiana, Ohio, Pennsylvania, West Virginia, Virginia, Florida, and Minnesota. He is a member of the Engineering Society of Detroit, the Michigan and National Society of Professional Engineers, the American Planning Association, the Detroit Area Economic Forum, and the Mid-America Economic Development Council.

Since 1952 Mr. Stephenson has been involved at middle and upper management levels in the planning, programming, design, construction, and operation of several billion dollars worth of construction related projects. These include work on industrial, commercial, and institutional programs throughout North America.

Mr. Stephenson has also chaired more than 50 partnering charter meetings for both public and private sector projects, and has lectured extensively on the subjects of project management, network modeling, alternative dispute resolution and partnering . He has also recently completed a book on Design and Construction Project Planning for John Wiley & Sons.

He has also taught hundreds of technical and management seminars in the United States, Canada, and Europe, has written several technical magazine articles, and is the co-author of a book on critical path method. His broad experience has given him an understanding of the nature of small, medium, and large size companies, and of the need to solve their management problems through creative, systematic, and workable approaches.