

# Application of Process Management in Design and Construction of New or Renovated Facilities

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## EXECUTIVE SUMMARY

The use of a process approach allows diverse teams to become more productive than teams without a process approach. Having a process to follow brings continuity to project teams who may have to deal with changing personnel throughout the project life cycle.

By focusing on a process, team members can minimize the interpersonal conflicts that inevitably arise as teams develop.

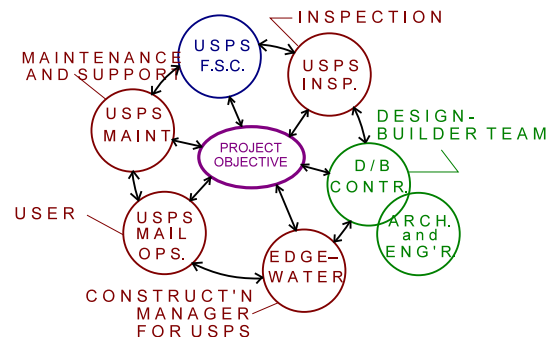
## CHANGE

Change is inevitable. Truer words have never been spoken about most new or renovation projects. In today's age of reduced cycle times, downsizing and outsourcing, the team's mission and the team itself may change drastically from its formation to its conclusion.

Fortunately, there is a solution to minimizing the impact of change is a combination of a self-directed team model with a process approach. The self-directed team model brings with it a focus and a structure. Process management provides the team with a road map through the obstacles they will encounter as they join forces and proceed.

The self-directed team model shown here has been successfully demonstrated in numerous projects for both governmental and corporate owners. In its first application for the United States Postal Service, the self-directed team model produced a major project in half the normal time with cost savings of 25%.

## SELF-DIRECTED TEAM



The self-directed team model focuses the entire team on the Project Objective. The more clearly the objective is expressed and understood by all the participants, the more predictable the results. Ideally, the objective is based upon a business plan that identifies the team's specific mission and the constraints within which they have to operate. Those constraints could include a window of opportunity within which the project must be completed and put into service, the required performance characteristics of the project and the financial resources allocated to the project.

The self-directed team model shows the variety of major team members which can occur. While several of the functions may be consolidated into a single organization or individual, it is just as likely that they will not be. Most of the team members will be from different departments or organizations. If not complete strangers, they are at least likely to be individuals who have not worked together. Each may represent a different agenda that must be reconciled by the team. By continually focusing on the objectives of the project, the team members can converge their focus on solutions.

## **TEAM BUILDING AND EMPOWERMENT**

Ideally, the team will take the time while forming to engage in team building exercises. However, the pressures of both time and budget are often so extreme that this essential step is missed and the team moves directly from “forming” to “storming” in which their diverse agendas and operating styles begin to clash.

Empowerment of the team members by their respective departments or organizations is extremely critical. The individuals must be empowered to deal with project issues within the constraints of the Project Objective. This does not mean that the team members can do whatever they want. True empowerment sets a much higher standard. Each empowered team member should both propose and evaluate solutions based on their positive impact on advancing the Project Objective. If a particular constituent’s agenda contributes toward progress to the project objective, that is beneficial. If it does not, the empowered member should defer to those proposals which do advance the project objective.

## **EXPANDING KNOWLEDGE – CONVERGING FUNCTION**

An important concept throughout the life cycle of a project, but particularly during the “storming” phase is the use of a technique known as Expanding Knowledge-Converging Function. If each of the team members openly contribute their knowledge of the problem and its potential solutions, they will increase the level of knowledge of all the rest of the team members. Through collective similar actions, the entire team will develop a better understanding which will then allow them to apply their personal knowledge and that of their organization the Project Objective. The better everyone understands the problem, the sooner that they can all productively converge on a solution. By using this technique, the team members will begin to move into the “norming” phase of the team’s development.

We have found that the self-directed team members, however knowledgeable and empowered they may be, typically draw some of their associates to increase their own knowledge base. We all know from our own personal experiences that we are more likely to offer a solution when we are confident that we know what we are talking about. A process tool that can be used to gather input from the supporting resources is to form an email group which receives notice of the various issues that the project team is considering. Before the days of e-mail, we used to broadcast faxes to accomplish the same purpose. Today, we use Extranet discussion databases to post a topic where each of the team members and their resources can access it and contribute from their own experiences. By using a shared database, everyone’s collective knowledge and contributions are available to be shared and to be improved upon. If the team is not

using an Extranet, anyone with e-mail should encourage their group to e-mail always to the project group when conducting team business. If both outgoing and incoming messages are “broadcast” to the project group, everyone has an opportunity to contribute. Everyone’s contribution or lack thereof is also documented.

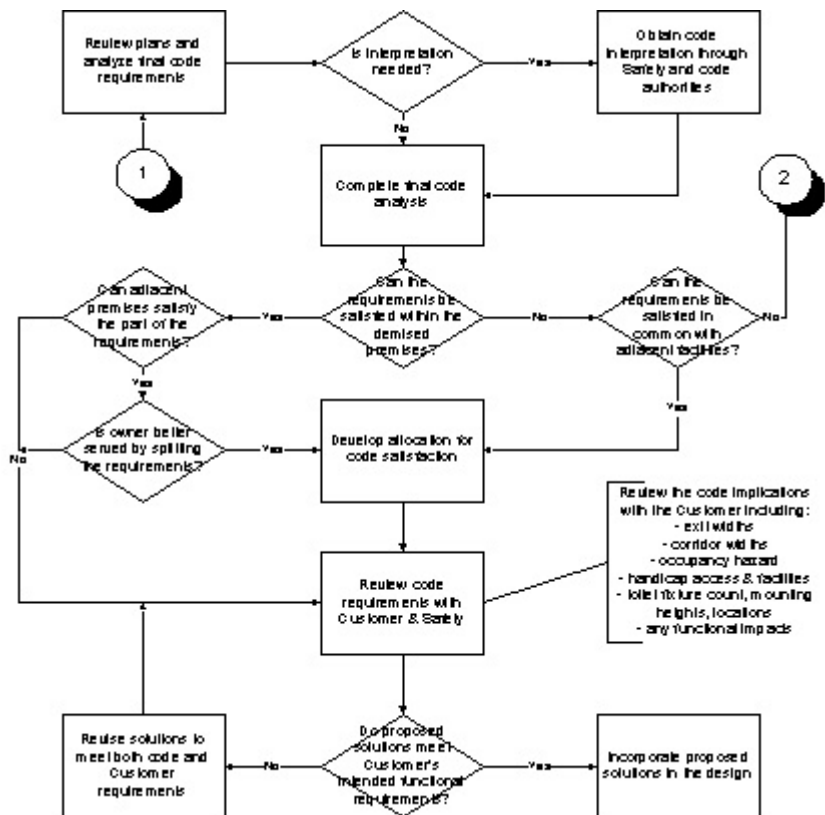
## PROCESS OWNERSHIP

During the “storming” phase, our interpersonal skills will be severely challenged. As team members, our personalities and agenda are still getting in the way of our way of making positive progress. The concept of a Process Owner can be used to bring accountability to the team without having to base that accountability on personality. As a Process Owner, you are responsible for administering a particular process until its conclusion. The key to avoiding interpersonal conflict lies in focusing on the process and not on the individual. Your fellow team members have a right to expect you to administer the process to the best of your ability. They should also expect to support you to the extent that the process calls for their involvement. If there is a failure and you have done your best, it is a “process” failure not your personal failure as the Process Owner. It will take some time for the team to operate this way. Once they do, everyone can concentrate on the project objective without the distraction of the interpersonal conflicts.

## KNOWLEDGE BASE

The second cornerstone of success is a knowledge based process that will get the team through to their objective. The process knowledge base is likely to be a composite of the processes of many of its team members. The team can use their pooled processes to develop ones most appropriate to their needs. Whether by re-engineering several processes or developing new ones when none exist, the team will create a guideline for its actions. Through continued use and re-engineering, guidelines can be made more effective and their success will foster their use.

A process approach to building code analysis is shown below. The essential ingredient is the comparison of the project objectives with what the appropriate code will allow.



The above example resulted from the reengineering of a process which was focused solely on the design issues. The re-engineered process emphasized the project objective.

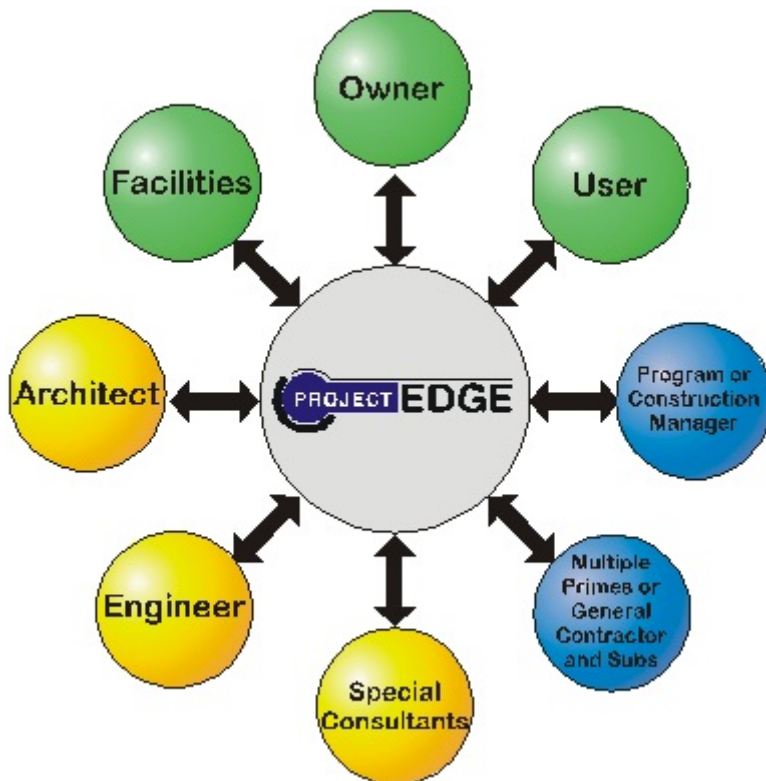
## REFINED MODEL

We have been using, refining and improving the above techniques for the last eight years. During the last several years, we recognized the need to carry the result one step further. We needed an electronic means of combining the project objective with the knowledge database of the team participants. The model shown below is the adaptation of the self-directed team structure in which the project objective is achieved through a common knowledge Extranet database about the project in which all team transactions are both facilitated and documented. The database contains all team correspondence, meeting minutes, drawings, value engineering and other discussions, design decisions, and the

many other functions essential to collaborative project management. By taking such a tool and making it available over local networks or the Internet, the entire team and all of the supporting resources have access to the project information whenever or wherever they need it.

## RESPONSIBILITY MATRIX

Regardless of the size of the project or the number of players, one of the first steps in program management is to review a matrix of all the functional areas which are likely to be encountered and assign a responsibility to each of those. Use a matrix similar to the one shown on the next page to determine whether each item is likely to occur on the project. If it is, then determine primary and secondary or alternate responsibility for that item. Additionally, evaluate primary and supporting responsibilities.



One of the principle benefits of using the matrix is that all of the potential functional areas are addressed and responsibilities assigned if those functions are needed on the project. The matrix evaluation should lead to discussions of how the team is going to work together and how they should communicate within the team, and with other interested parties. The team should investigate using an Extranet to share information about the project with one another. The model depicted below is an adaptation of a self-direct team model which shows the individual team members interacting with an electronic database which contains all the project information. Among the available products which furnish the services is ProjectEDGE which was designed with a program management orientation.

SERVICE ITEM	REQUIRED ON PROJECT		OWNER RESP	EDGEWATER RESP.	OTHER RESP (LIST PARTY)	REMARKS
	YES	NO				
<b>1. PERMITS</b>						
a. BUILDING						
b. AIR QUALITY						
c. SITE PLAN						
d. SUBDIVISION						
e. CERTIFICATE OF OCCUPANCY						
<b>2. BUDGETING</b>						
a. INITIAL						
b. CHANGE ORDER						
c. "OWNERSHIP"						
<b>3. PROGRAMMING</b>						
a. DEVELOP PROGRAM						
b. REFINE PROGRAM						
c. BENCHMARK PROGRAM						

Some of the features of ProjectEDGE which the team should explore are described below.

ProjectEDGE emphasizes a process or workflow orientation for which many process templates are supplied. Electronic routing processes are provided for Requests for Information (RFI) and submittals as well as for contracts and change orders. Each of those processes is built on the concept of a process owner being responsible for managing one or more processes in a functional area. The process owner is the focal point of responsibility for actions taken. For example, the chairperson of a meeting will be the process owner responsible for seeing that the agenda was prepared, all participants were

invited and supplied a copy of the agenda, the meeting was held and minutes generated along with follow up comments and any action items. The process owner of the meeting may not personally perform each step in that process, but is responsible for each of them being done.

By using a coordinated database, together with defined processes, the project team can rely on the application software to act as an electronic facilitator of their actions. The database will track each of the process including informing the next person in line when action is required. Moreover, when any of the action items becomes due, the responsible parties will all be notified.

For more information on ProjectEDGE, white papers or demonstrations, visit our web site at [www.projectedge.com](http://www.projectedge.com) or contact us at 888-516-EDGE, Fax 315-471-6659 or e-mail at [projectedge@edgewater.net](mailto:projectedge@edgewater.net).

About the Author:

W. Gary Craig is a University of Toronto graduate with a degree in Civil Engineering and a diploma in Operations Research. Mr. Craig also holds a Master of Science in Management from Rensselaer Polytechnic Institute. Mr. Craig has over 30 years of experience in construction management and real estate development.

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