Facilitating Collaboration

in the Design Stage of Complex, Multi-stakeholder Projects

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Abstract

Complex, multi-stakeholder projects require a greater degree of collaboration and facilitation than other types of projects. We divide a complex project generically into three major, overlapping processes: strategy, design-build and operations. This paper focuses on how to facilitate the collaboration of a diverse set of stakeholders through the design-build stage of the process. We think about design-build not as a series of linear steps but rather as a web of interconnecting activities happening mostly in parallel and overlapping with the strategy work that precedes it as well as the operations work that follows. This overlap is crucial to maintaining flexibility, because design of complex projects is more a learning process than a project management process. Learning processes require the ability to cycle back and adjust the design—otherwise there is no learning and instead you just hope for the best on your first shot. We offer a few notes on the difference between facilitation and management and the necessity for both. The core of the paper addresses the process, methodology and guidelines for facilitating collaboration in complex projects. The process section examines a set of generic stages of work that happen during design. The methodology section explores the way in which each collaborative exercise during the design is crafted and facilitated. It's a toolkit to help managers work through the design stage with multiple stakeholders. The guidelines offer some of the counter-intuitive rules of thumb that we believe improve the facilitation success of these types of projects.

Definitions

We think of *multi-stakeholder projects* as those that typically require (or at least will benefit from) the inclusion of ideas and perspectives from the organization that is originating the project, organizations that will be providers and users of the project's results, individuals or groups involved in the ownership or governance of the originating organization, and specialists or those with subject matter expertise.

We believe that *complex projects* comprise that subset of projects that exhibit the following characteristics:

1. They are different in nature from other projects that the organization has experience with—they are unique. Either the organization has never attempted a project like this, or conditions surrounding the project are so different that past experience and solutions should be viewed with skepticism.
2. They are composed of so many different facets that no individual or small team possesses all of the knowledge, experience or skills required to design and implement them.
3. They are large enough financially to pose a significant risk to the organization if they are not conceived of and executed well.

Some examples of complex, multi-stakeholder projects include the design of large buildings or manufacturing facilities, the design of large IT systems, the design of communities and city services, the creation of new products and services for wide scale rollout, the creation of major motion pictures, the response to complex requests for proposal, and multi-national initiatives.

Three Stages

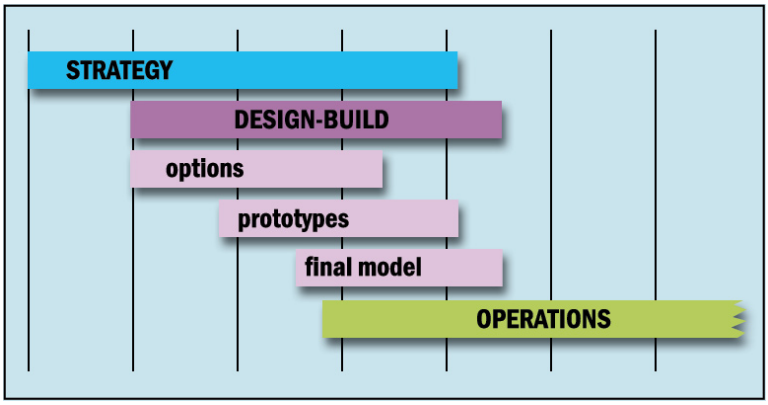
We model *complex projects* into three stages: strategy, design-build and operations. The project is conceived in the strategy stage as a response to some opportunity or challenge. During this stage the project gets its initial blessing in terms of seed resources (capital, time, team, champions). Strategy also equips the project with its initial objectives. If the project is large enough, it may have its own mission. Sometimes there is also a rudimentary vision.

At the other end of the process, in the operational stage, the components of the project have been designed, built and assembled. The project is ready for daily operations and full time engagement with the users.

In between operations and strategy lies the design-build stage. It consists of planning, creating various prototypes to test, and actually constructing or building the final capabilities that will be used in the operational stage. Design translates the strategy into a model of how the final operations will work. We also consider any construction to be a part of the design-build stage. This may seem counterintuitive but reflects our strong tendency toward design-build philosophies from the field of architecture and construction. The design of a complex system and the building of it inform one another in cycles of feedback. If these cycles are broken, and the design is divorced from the construction, then construction may become an exercise in compromise. With many major projects, once the construction of the building or system or assembly line or service is completed, the ability to bring additional design to it is severely limited. During construction, there is always some opportunity to bring a design response to a new challenge or opportunity. So we like to think of construction as an extension of design that precedes operations. For simplification, in the rest of the document, we'll refer to the design-build stage simply as the design stage.

Type of Project	Strategy	Design-build	Operations
Motion Picture	Business planning	previsualization through final editing	distribution
Manufacturing Facility	Competitive analysis, scenario planning, business planning, risk analysis, goals and objectives	programming through preliminary design through contract documents	Start of production
New Service Design	Competitive analysis, gap analysis, risk analysis, strategic direction	Option generation, building prototypes, testing, assembling final model, design of support systems	Rollout and Execution
RFP Response	Business analysis of risks and rewards	Crafting the response	Award and execution
Organization Redesign	Competitive analysis, business ecosystem analysis, scenario planning, strategy formation, strategic hypothesis and goals	Whole system design (future), transition plan and strategy, adoption plan and strategy	Rollout and Execution

The three stages should overlap one another for as long as possible. This thinking may be counter to common practice, but it allows the project to be steered as it moves forward like a guided missile and not simply released like an arrow in hopes of hitting a target that's often in motion. As a project takes on better definition during the design stage, it will usually challenge or augment the work that was done in the strategy stage. Likewise, activities that take place in the operations stage can reform and update concepts from the design stage unless everything has been set in stone. If there is still a dialog between these stages, then changes can be made more easily than if there is a hard and fast hand off from strategy to design and then from design to operations. This doesn't obviate the need for contract documents or for having detailed designs so that everyone on the project knows what they are doing. However it is a call for stretching flexibility to the extreme so that all of the learning along the way can be folded into the final release of the project and not lost along the wayside. In manufacturing, it's a well known principle that 80% of the inefficiencies in a process are built into it during the design of the physical plant. Subsequent quality improvement efforts can only address the remaining 20%. How important, then, it is to work diligently to reduce the inefficiencies generated during the design-build phase of work. The rest of this paper sets out some rules of thumb to help managers think through the design stage of a complex, multi-stakeholder project.



Facilitating the Design Stage

We use the term "facilitate" deliberately. Project management and project facilitation are related but have their own purposes. Project management sets in order and tracks the application of resources to tasks over time. Project facilitation is concerned with the collaborative and idea aspects of the project—enrolling, engaging, aligning and focusing the collective talent and collective ideas to create the best solutions. Both project facilitation and project management require the application of leadership principles and do not relieve the management team in any way of its responsibilities for the ultimate success of the project.

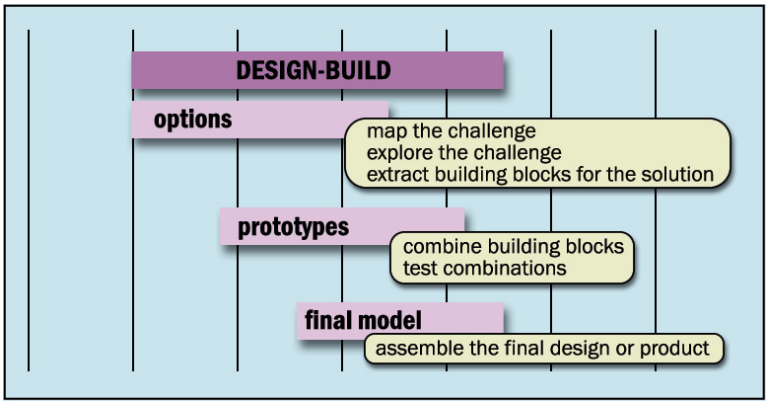
But a facilitative approach to project design is different than a command and control approach. Underneath the facilitative approach is a belief based upon experience that the best solutions during the design phase will emerge through the structured and unstructured interaction of many different constituents and that as these ideas combine and recombine they will improve in general fitness until the optimum is revealed. This coincides with a belief that the final solution is too complex or too obscure to be conceived by a single individual without this collective effort. These beliefs have nothing to do with some fuzzy, feel-good desire to involve people for the sake of involving people. They are based upon two ideas: (1) work from the sciences of complexity that suggests that a collective or collaborative approach to problem solving naturally generates better solutions than other approaches, and (2) the observation that people tend to support whatever they have had a hand in creating. If these two ideas are right, they lead to better solutions with higher alignment among stakeholders than a top down, forced approach to design.

Notes on Process

We divide the design phase into three components: exploration of options, creation of prototypes and the construction of the final model. There's nothing new about this type of division. The approach however may be a bit unusual.

Generating Options Using Building Blocks

The exploration of options is essentially a mapping exercise. Its purpose is to chart the boundaries and major features of the space occupied by the challenge and its possible solutions. This can only be accomplished by a robust exploration. We don't know what we don't know. The best solutions to complex problems most likely lie outside of the team's set of experiences—otherwise the problem would not be complex. The purpose of exploration is to give the team new experiences from which to ideate and create. As with any exploration, many of these ideas will be irrelevant, but a core of valuable ideas will be unearthed. There are a number of techniques that can be used to explore a challenge thoroughly—some are well known, such as the techniques invented by Edward DeBono. Others are just emerging as applications for business use, such as the work on combination by John Holland and patch logic by Stuart Kauffman and the work on collectives by Norman Johnson. All exploration takes time, but to ignore this stage of work simply means that the



team will create their solution based upon only their past experience. Such solutions may be adequate; they are rarely extraordinary.

Generating Prototypes through Combinatorial Techniques

As the challenge is mapped, a number of ideas will emerge that have a certain appeal as either part of the solution or a pathway to the solution. Usually the solution does not emerge from exploration in whole form. Instead, the ideas found during exploration have to be combined into sets from which whole new models of potential solutions can be generated. These models, if robust enough, can become prototypes which can be tested. From the prototypes, a final model emerges—usually as a synthesis of several of them.

John Holland describes one type of combinatorial technique that uses building blocks in combination. He poses a challenge: to identify the most "honest" human face. (He also notes that it is interesting that humans would actually take such an assignment seriously.) He divides the face into components (eyes, nose, mouth and so on) and then for each of these components creates a series of building blocks of different options (different types of eyes, noses, mouths). The different building blocks represent the components of the "DNA" of the challenge. These are then assembled together in combination and individuals are asked to decide which combinations are the most honest-looking. The most honest ones are then advanced to the next round where they are combined with one another using a genetic algorithm, allowing for some random addition of building blocks to account for serendipity and mutation. The next set of combinations is evaluated and the process continues for a few more iterations. After five generations in most of these experiments, all of the faces in the group will be considered more honest than the "most honest" face from the first generation. This approach, with some modifications, describes one of the combinatorial processes that we recommend for use in the solution of complex problems by businesses.

Throughout the design-build process the stakeholders move back and forth from generating options to creating prototypes to attempting the construction of final models. Since this is a learning process, it cannot be linear. The set of building blocks defined at the beginning of the process is most likely lacking in scope and depth. As the group tries to generate solutions, they will be forced to expand their exploration to uncover additional building blocks and try them in new combinations.

Notes on Methodology

Much of the work done during the design stage is individual—about 60%-80%. Somewhere between 10%-20% of the work should be done collectively, face-to-face if possible. The remaining 10%-30% should be done collectively using digital tools that actually aid in the process of exploration, combination and testing. This goes beyond email, although email ends up being the default tool for remote communication.

Stakeholders usually work as individuals when they are building components of a solution. So an analyst might work on a spreadsheet modeling the risk factors of the project. An engineer might work on a drawing for structural steel in a new factory. A 3D modeler might work on a shot for a major motion picture.

Stakeholders are brought together for three major reasons: (1) to share updates and status; (2)

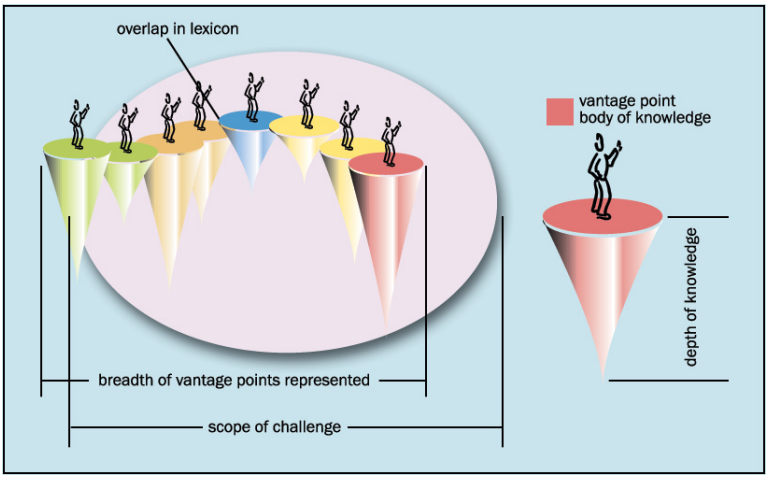
to plan or create collective designs; (3) to handle changes or crises in the design or plan.
Updates and status reports are becoming increasingly digital in nature, and they should be. Online project repositories and management aids replete with photos, video clips, text summaries, project plan updates, and documentation should be standard fare on any complex project.

Planning and design happens periodically during the design process. Once a project management system is in place, much of the plan updating can be done via the system. But whenever a new component needs to be designed or a new phase of work is entered upon or a prototype or model needs to be created, there's an opportunity for collaborative design to occur. Collaborative design, if facilitated properly, can accelerate the process, increase alignment among stakeholders and increase the fitness or viability of the model.

Changes, crises and exceptions occur throughout the project. Minor changes can be handled by email or through the project repository. Larger changes or crises that cross over functional areas of expertise require a collaborative intervention. Either the various parties meet together via phone, internet meeting tools or in person.

The Five Foundations of a Good Collaborative Solution

How should the collaboration be approached and managed? Throughout the process the facilitation and management team must ask itself several questions around enrollment, engagement, knowledge vantage points, knowledge depth, and overlap. If these five factors are aligned, the viability of the final solution increases



1. Are the stakeholders enrolled?
Do we have all of the stakeholders signed up? Are they attracted to the project?

2. Are the stakeholders engaged?
Are they both motivated and diligently applying themselves to the project? Are they challenged and rewarded by participation?

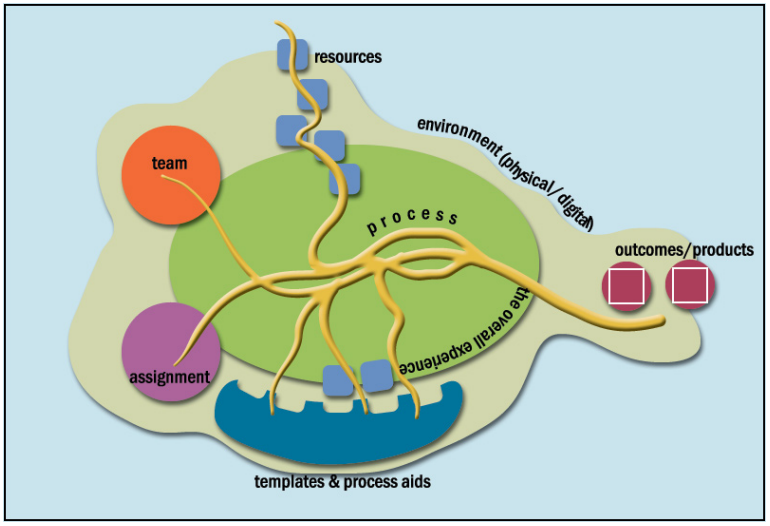
3. Are the right vantage points of knowledge available?
Collectively, do the enrolled stakeholders represent enough variety in their personal vantage points so that all of the aspects of the challenge and the solution can be mapped out?

4. Is the right depth of knowledge available?
Is the necessary information accessible either through people or databases, or other repositories of knowledge and is it of the right depth for the project?

5. Is there enough overlap between vantage points among enrolled stakeholders?
This refers to the lexicons that are present on the project. Engineers need to speak with scientists and HR specialists need to speak with attorneys and so on. The project team must either have individuals who have experience across several lexicons and professions, or time and attention must be built into the process to allow the stakeholders to understand enough of each other's language so they can develop a shared context and a cohesive solution.

Creating and Supporting the Work

Throughout the design-build phase, individuals and teams will be assigned to accomplish a variety of tasks. Each task can be thought of as an assignment. With each assignment there should be a specified outcome or product. This outcome may change or adapt as the team moves through their assignment, and that's OK. But it's good to have a target outcome from the beginning as well. The team will need resources. Usually the most important resources are time and budget. However other resources may include access to subject matter experts inside and outside the organization, special tools, equipment and software, access to knowledge bases, and a variety of supplies. The team may also be supplied with templates to help them organize the content of their work. The templates usually serve as a starting point for organizing information and may be discarded as the team learns more. Some of the templates take the form of tools (like the seven tools to aid in statistical process control). The team may also be given process guidance—a series of steps to take that lead to the delivery of the outcomes. Finally, the team will work in a physical and virtual environment, and the impact of those environments should not be neglected. The team probably needs a digital "home room" and possibly a physical home room as well if their task is long or complex. These environments should aid the team in *seeing* their work as they progress.



Some Guidelines

There's no firm set of principles that govern the facilitation of a collaborative design process. However, there are a number of rules of thumb that we've found to be valuable over many years and hundred of clients. Some of the more controversial are presented here for the reader's consideration. It's important to understand that much of business is dominated by a hierarchical, command and control approach to work. This is not necessarily bad, but it does mean that some mindsets should be changed to successfully apply a collaborative, adaptive approach.

1. Have teams work in parallel; avoid working linearly

This is one of the hardest guidelines to convince people of in advance. It is desirable for the team of stakeholders to simultaneously work on vision, goals, action plan, marketing ideas, staffing and so on. Each design component is taken as far as that team can take it, given the information they have and their assumptions. Then the various teams compare their ideas and in the comparison, the whole solution ratchets up in fitness and quality. Trust us on this one. The reason it works is that a huge part of the solution set is already in some stage of formation in the minds of the various individual stakeholders. The purpose of the early stages of the collaborative process is to get all of these ideas and perspectives out onto the table at once and allow them to interact with one another. The interaction will precipitate good solutions. In addition, each stakeholder will be at a different stage of the creative process and this allows them to bring their visions from that stage to bear on the challenge.

2. Engage stakeholders in co-design rather than simply getting their input

There's a tendency to get input from various groups surrounding the design through the use of surveys, focus groups and so on. Unfortunately, asking someone's opinion of something isn't nearly as effective a use of their intellect as engaging them in the design is. Once a stakeholder has to bring his preferences to bear on the complexity of design, these preferences tend to deepen and broaden. They are molded to the point where they can better inform the design process in a way that takes into account the multitude of variables that interact in the design. Have customers sit down with engineers and actually try to solve something together. Of course the nature of the assignment has to be crafted carefully because they won't share much of a common lexicon, but if you're successful you'll be very surprised by the results.

3. Immerse stakeholders in the challenge instead of letting them just skim the surface

This is related to the previous guideline but refers to the intensity and length of time of the interaction. It's true that some stakeholders will be brought in for only a brief period of time, but wherever possible, allow stakeholders to interact over longer periods of time, on diverse tasks, and when they interact face-to-face, stretch the time of interaction to a day or more. If the assignment they are working on is complex, allow at least 1 ½ days. The overnight will provide a period of incubation and the duration of the experience will allow greater alignment and team building to occur.

4. Envelop stakeholders in words, pictures, objects, and simulations that transport them into their ideas and into the challenge instead of relying on conversation alone to forward the design

There's nothing wrong with verbal communication but it's hampered in Western society by several fetters. First, people don't listen very well. While someone else is speaking, they are thinking about what they're going to say next. Second, conversations can go round and round unless a team is charged with committing something to paper. It's like an artist running ideas for a painting around in his head but never committing brush to canvas. When groups of people get together they ought to have deliverables for their time—deliverables that are exchanged with some other team. A two-dimensional sketch of a challenge and solution can address four times the complexity of a single-dimensional list of words or statement. A three-dimensional representation made out of simple building materials can address even more complexity. A model in motion can show behavior over time. Some of these tools are expensive in time to create but return more than their value when used in testing. Until you can create a model of what you're talking about, you don't understand it. And this is doubly true for a team working together.

5. ; Think of design as iterations of a complete whole that gain successively better clarity and detail over time; don't think of design as separate components and little steps

The first day that you sit down to work on the project, design the whole solution by the end of the session, even if it's sketchy. This is similar to the process used in the movie industry where a storyboard artist and the director sit down to create a previsualization of the entire movie through a series of sketches of scenes and sequences. After previsualization, the entire movie has been created at one level, and from then on, the whole movie begins to shape up and take on more depth and fitness until final editing is completed. When we work with clients on build-

ing or land planning sessions, we want them to create various visual options of the project by the end of the first or second round of work. Often we don't even have them create a program first, but let the first iteration of the program emerge out of the sketch.

6. Give stakeholders experiences that help them warm up and practice the art of collaborating and creative ideation; don't assume that they know how to ideate or collaborate with one another

At its lowest expression, collaboration is a confrontational win/lose game where one person's ideas will succumb eventually to another's. At its highest expression, collaboration involves the combination of ideas in such a way that a new idea emerges—something different from any of the inputs. In-between, collaboration involves adding parts of different ideas together so that the result fits nicely into the solution space of the challenge and resolves it. Many of us don't know how to collaborate on the higher levels and some instruction is required if you want to see it happen. It won't just happen on its own.

7. Select stakeholders that have different lexicons and set aside time for these lexicons to weave together to create better understanding, instead of falling back on a group of stakeholders who share a common lexicon or idea set.

This was mentioned above in notes on the methodology. Complex problems by definition require stakeholders who have different expertise. The design of a building requires input from engineers of various sorts, interior designers, workflow analysts, the workers who will use the building, and so on. These different constituents speak in different languages and time must be set aside for them to learn enough of each other's terms of art so that a good synthesis can be created.

8. Increase the diversity of people in the design team who think differently in order to expand the perspectives on the solution space, rather than underestimating the value of diversity in generating better solutions

In particular, cognitive diversity (people who have different ways to think and solve problems) tends to drive to better solutions. If everyone on the team has the same background and experience, they will find it extremely difficult to invent something new or to avoid falling into traps hidden in their blind spots. The team needs to have a shared understanding of the overall purpose of what they're trying to accomplish but beyond that a healthy diversity in modes of thought and values creates the variety requisite to generate a good solution to the challenge. So believe it or not, assembling a group of really smart people to solve a problem is not necessarily the best approach. If you have a lot of very smart molecular engineers together, they will all very likely think in very similar ways—their training and toolsets will have very little diversity. They will see the problem in the same way, and if the problem before them is intractable to one, it will likely be intractable to them all.

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