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Analysis of the Edith Green Wendell Wyatt Federal Building modernization project (Portland, Oregon) DNSC261 Intro to Project & Program Management Dr. Andrew Griffith   
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Introduction and Background to the Edith Green and Wendell Wyatt Federal Building Modernization Project   
The 35-year-old Edith Green Wendell WyattFederal Building (EGWW) is a high-rise structure located in downtown Portland, Oregon. The 18-story building is named in honor of two distinguished members of the U. S. House of Representatives: Edith Green (1955-1974) and Wendell Wyatt (1964-1975), (Fact Sheet 13: Executive Summary). In the mid-1990’s GSA’s Northwest Arctic Region 10(R10) began studying the building’s deficiencies as part of a remodeling plan, but it was not until 2003 that GSA contracted SERA Architects to begin drafting documents for a major modernization of the building. Unfortunately, due to federal budget constraints, the project was shelved in 2006.   
In February 2009, as part of the American Recovery and Reinvestment Act (ARRA), the US General Services Administration (GSA) was tasked with reviewing its backlog of shovel ready infrastructure projects for well planned projects in an effort to help create jobs in the construction and real estate sectors, while simultaneously making use of energy-efficient technologies, smart building design and green energy solutions. ARRA funding also required government agencies to streamline the way they did business, cut costs while doing so, and deliver a quality product over a shorter period of time.   
Since the Northwest Arctic Region 10 had the modernization of EGWW on hold due to a lack of funding, they selected this design-bid-build project for funding. As the EGWW project was considered “ shovel ready,” meaning many of the documents had already been created; GSA determined the project a worthy recipient of funding. The EGWW modernization project provides for an interesting look at how effectively GSA was able to deliver on those requirements using project management techniques.   
In receiving ARRA funding, the project was in turn agreeing to abide by ARRA funding mandates, which introduced project constraints to the scope, cost, and schedule of the project and impacted how the project would be managed and delivered. Part I of this paper will explore the impact that the ARRA funding mandates had on the scope, cost, and schedule of the project and how GSA elected to manage the project in light of these funding mandates. Part II of this paper, through a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, will look at four broad questions:   
Is sustainable/smart building design a value add for government agencies and/or for taxpayers?   
How does an accelerated project schedule benefit and harm a project?   
Does global project management meet costumer need? Is it a proper stewardship of tax dollars?   
What implications do the project management tools of the EGWW modernization project have on future GSA projects? What contributions has the project made to the body of knowledge for project management?   
PART I   
1. 0: Project Constraints and Assumptions   
As mentioned in the Introduction, the primary constraints for this project were the mandates that the use of ARRA funding placed on the project, namely:   
1. GSA completes the EGWW project within 48 months. The average timeline for completing a project of this magnitude is anywhere from 5 to 10 years.   
2. The building must be converted to a “ high-performance green building” as outlined by the Energy Independence and Security Act of 2007 (EISA), which determined the standards for energy efficiency design. In the case of EGWW, this is being accomplished by attaining certification from the United States Green Building Council (USGBC) as a Leadership in Energy and Environmental Design (LEED) rated building. LEED ratings are based on a scoring system with escalating points based upon certain levels of, for instance, energy conservation.   
Given the project’s constraints due to the ARRA funding mandates, GSA made two general assumptions about the project:   
1. New delivery methods, including co-locating the entire project team, would need to be explored and a more deliberate planning effort during the initial planning stage would need to be employed to allow for expedited project execution.   
2. Since so many of the project tasks had to occur simultaneously, risk could be mitigated by using Building Information Modeling (BIM).   
Before exploring the impact of the project’s constraints and assumptions on the project’s scope, cost, and schedule, the next section will turn to look at GSA’s culture of project management and how that culture shaped the project team and the project delivery methods.   
2. 0: Leadership and Management/Team   
2. 1: GSA’s Culture of Project Management   
Established in the 1950s, one of the first major tasks GSA took on as an agency was the major overhaul of the White House. Every time the country elects a new president, GSA coordinates the frantic 5-hour period where the previous President moves out of the White House and the incoming President moves in.   
As a federal organization, GSA’s project managers and procurement teams are required to strictly follow the Facilities Standards (P100) process for a major modernization process like EGWW. The P100 establishes design standards and criteria for new, major and minor alterations, and work in historic structures for the Public Buildings Service (PBS) branch of GSA. Although the GSA process has more built in obstacles than their private sector counter parts, it is deemed necessary because GSA are employees entering into contracts on behalf of the Federal Government as opposed to a private citizen or Corporation.   
2. 2: Integrated Project Delivery   
GSA realized early onthey could not use of the standard P100 contract processand complete the project in the time frame mandated by ARRA. R10’s Leadership viewed the EGWW project as an opportunityto become the leaders in innovation for project delivery. Furthermore, GSA wanted to transition from their traditional contracting process to integrated project delivery (IPD), a method of project delivery distinguished by a contractual arrangement among the owner, general contractor, and design professionals that aligns business interests of all parties through collaboration during the design and construction processes and tying stakeholder success to project success.   
With EGWW, GSA committed to a full-fledged public-private partnership through IPD. The success of the project would allow GSAto position themselves as leaders of innovation within the industry, which would mean having their pick of the best teams in the market for future projects.   
GSA knew an integrated and collaborative delivery method might not fit everyone and when establishing the project team employed two important criteria (beyond the designated skill set): an ability to take input from multiple sources and capacity to keep an open mind. When team members did not fit in with the culture, project leadership replaced them.   
Pat Brunner (GSA’s Design & Construction Supervisory Project Executive) was selected as the project manager and in selecting the project team focused on familiarity among team members, passion among each team member as demonstrated by the desire to work with others, learn, and innovate for the good of the project. In the end, individuals from the organizations listed below made up the 16-member project team:   
Architect: SERA Architects   
Design Architect: Cutler Anderson Architects   
Landscape Architect: Atelier Dreiseitl   
Signage Design Consultant: Mayer/Reed   
Mechanical Engineer: Stantec   
Structural & Civil Engineer: KPFF   
Electrical Engineer: PAE Consulting Engineers   
Plumbing Engineer: Interface Engineers   
Commissioning Agent: Glumac   
Construction Manager Construction: Howard S. Wright Companies   
Mechanical Subcontractor: McKinstry   
Electrical Subcontractor: Dynalectric   
Demolition Subcontractor: Nuprecon   
Curtainwall Subcontractor: Benson   
Elevator Subcontractor: Otis   
Drywall: Cascade Acoustics   
2. 3: Implementing IPD   
Once the project was authorized, the project team employed 6 key components to improve the use of IPD through the two main phases of the project (i. e., the design phase and the construction phase): Federal Construction Magazine, Fall 2012)   
1. While GSA provided on-site management, all team members co-located into a single office space to encourage collaboration and provide answers in real time.   
2. The team utilized BIM, as required by ARRA, to leverage coordination between design teams, which in turn allowed the team to utilize models to accelerate the project schedule and integrated the development of documents.   
3. The team decided early on, the way to go fast was to start slow. As a result, they spent the first five months focused on determining optimal engineering drawings/designs before handing off to architectural design teams.   
4. GSA leadership took an active role in negotiating project labor agreements to address the challenges of emerging small businesses and non-unionized contractors.   
5. GSA waived Federal Government requirements and utilized industry practices and standards in order to more accurately reflect private sector contractor’s market environment.   
6. Utilized snap shots as part of a package of lessons learned which were shared internally within the project team but also shared with the Office of Federal Procurement policy in hopes of possibly of revamping the way they approach large capital projects in the future.   
The following sections will look more closely at the impact ARRA funding mandates and the decision to use IPD had on the project’s triple constraints of scope, cost, and schedule.   
3. 0: Triple Constraint: Scope   
3. 1: Project Scope   
The project’s scope has been a work in progress since the mid-1990’s when GSA began studying the building’s deficiencies as part of a remodeling plan. It’s easy to make the case for renovating an existing structure because it already exists, but modernization and renovation is complicated by the factthe building footprint is generally fixed. In addition, GSA’s sustainability standpoint is that it’s better to re-purpose building materials.   
As a result, the original 2006 scope was made up of two packages that were to be designed concurrently: 1. Base Building – Core/Shell and 2. Tenant Improvements. Although this scope included many design features that are considered sustainable, with the influx of $139 million as part of the ARRA funding package, the new design intent was much more mammoth in size and scale, as it set out to transform the existing structure into a landmark high-performance green building. This expanded scope requiredexamination of each and every building attribute in order to maximize the LEED potential of the building and achieve the highest level from the USGBC as LEED Platinum.   
At completion (projected for late May 2013), the building will be the cornerstone of GSA’s green building portfolio and is expected to achieve LEED Platinum certification from the USGBC. EGWW is part of GSA’s overall strategy to minimize the use of carbon-based fuels by taking advantage of cutting edge sustainable design throughout their Federal Building Portfolio. Post modernization, the EGWW building operations will feature a rainwater reuse system, regenerative elevators, radiant heating and cooling systems, and an exterior shading systems designed to minimize solar heat gain.   
All of these design features play a significant role in developing the scope for the project. It is important to recognize these features were elements added in as a direct result of the ARRA funding which is the driving factor in actually funding the project and getting it off the shelf and back on the ground. If the funding had not been designated for EGWW then it would have remained idle indefinitely.   
3. 1. 1: Impact of ARRA Funding Mandates on Project Scope   
While considering the changes to the 2006 scope with regard to LEED and ARRA funding, the project team was presented with the difficulty of amending the scope to account for time-constraints in order to deliver the project on an accelerated schedule. In order to meet the deadline to apply for ARRA funding, the design period was shortened from roughly two years to 14 months. Additionally, the team was asked to shorten the construction schedule from 54 months to 30 months (Fed Construction Article). This schedule impact has a sharp impact on the scope of the project and specifically affects the scope when thinking about what can actually be accomplished in the timeframe.   
It is interesting that the EGWW project chose LEED as a guideline when the ARRA funding used the EISA 2007 as a basis for efficient sustainable design practices. The LEED process is a lengthy and costly process. The funds used on LEED could have been used in other very valuable ways. It would seem that simply fulfilling the EISA requirements would suffice to achieve the desired sustainability results and save the project money.   
4. 0: Triple Constraint: Cost   
4. 1: Project Cost   
The project budget includes funding for architect and engineering services; the costs of relocating the tenants; and contract management activities. The construction budget is $110M, which includes installing new mechanical and electrical systems while replacing systems which have exceeded their useful operating life, increasing the attractiveness for leasing space by installing a new curtain wall, implementing energy-efficient technologies, smart building design and green energy solutions, and updating life-safety elements. Additional costs to the project include salaries for managers, contractors, architects, and wages for laborers. Total project cost is assumed as $123, 151, 653.   
4. 1. 1: Impact of ARRA Funding Mandates on Project Costs   
ARRA dictated all funding had to be obligated by September 2010 with all construction funding expensed by September 2014. In other words, the design plan and guaranteed maximum price (GMP) for EGWW had to be completed by September 2010 and the modernization of the building has to be final and complete (including all required reporting and invoicing requirements) by September 2014. Establishing the GMP required early input of expertise, including the CM and trade contractors, and, as discussed earlier, meeting this deadline would not have been possible with a traditional GSA delivery approach as SERA estimated using the traditional P100 contract process would have taken 27 months to establish the GMP and the project only had 8 months to revise the project scope and establish the GMP.   
Since GSA already had SERA Architect under contract, due to the original start-stop of the project, GSA elected to bring the entire SERA team on board to determine the GMP and meet ARRA’s compressed schedule for obligating construction funding. In addition, GSA allowed for the Howard S. Wright, the prime contractor, to propose up to five of the first tier sub-contractors. Doing so represented 60-70% of the dollar value for the total contract.   
4. 1. 2: Impact of Decision to use IPD on Project Costs   
Integrated Project Delivery (IPD) allowed for the project team to meet the required time frame and provided cost predictability, but the use of IPD in terms of costing the project was not without risk. The Architect/Engineer contracted for this project admitted the EGWW project is a test case for GSA to gain insight into IPD. Although this assertion allowed for some flexibility, GSA was unable to fully move away from existing P100 contract structures, as doing so would have required a change in federal legislation. GSA was interested in the IPD approach where each participant focused on the whole project and processes within. As seen in examples, the project team brought all interested groups together early in the design to collaborate together with GSA. This provided informed decision making in the beginning stages where all groups were involved and could streamline the government processes. Currently, GSA’s officer is only on the project half time, but believes IPD should require the owner to be on-site full time due to the resource intensive nature of IPD. IPD is proving to be vital to the success of the EGWW project as the project team was able to move forward with P100 contract structures and yet make headway on the schedule.   
In addition, due to the start-stop-start nature of the project, there are several different incentive structures tied to the existing contracts, all of which has had an impact on the cost and execution of the project contracts. For example, the original Architect/Engineer contract, which was executed under the traditional P100 process, does not include any financial incentives tied to project metrics. The CMccontract has financial incentives that entitled a percent of the difference between the Cost of Performance (final sum of cost of the work and fee)and the Guaranteed Maximum Price (GMP).   
4. 2: Project Management Strategies   
4. 2. 1: Utilizing BIM modeling   
ARRA mandated the EGWW project use BIM model for coordination purposes such as clash detection to prevent clashes virtually, prior to construction, so the potential clashes do not affect construction bottom line or delivery date. The project team also used constructability reviews and scheduling to minimize risk as mandated by ARRA. To advance the use of the model in design and construction, GSA pushed SERA to use BIM for tenant communication and virtualization, and Howard S. Wright to use the model for field layout. A great deal of time was spent in working out the different deliverables involved, for instance in architectural, mechanical, plumbing, and electrical works.   
GSA is monitoring and measuring the advantages of BIM and will continue to monitor change order reduction and constructability issues throughout construction. To help make the case for IPD to congress, GSA’s Northwest Arctic Region 10 has a target change order rate of less than 3%; typically congress would fund a renovation project at a 9% change order rate.   
4. 2. 2: Issue Management   
Issues and changes come every day on a project. The EGWW project team implemented an issue managementprocess, which encompasses an executive team that has lengthy meetings every week to discuss the outstanding unforeseen items that have presented themselves. This is very costly and time consuming, but necessary to the success of the project. At the end of the project it is expected there may remain unresolved issues. The project manager will review the outstanding issues with the project team and the GSA representative. It is normal to accept a reasonable level of imperfection that represents the best value between cost, benefit, risk and time. Any consequences should be agreed with the Project Sponsor and Steering Committee.   
5. 0: Triple Constraint: Scheduling   
5. 1: Project Scheduling:   
As alluded to before, the biggest scheduling constraint placed on the project was the decision to use ARRA funding since the mandated completion dates required an accelerated project schedule. As a result, the planning and design phase for the project was compressed to an14-month period with roughly 30 months for the construction phase.   
5. 2: Impact of ARRA Funding Mandates on Project Scheduling   
When GSA initially planned to renovate the building, the project plan outlined construction activity to occur while the building was occupied, requiring phasing of activities around tenant agencies and requiring tenants to move back and forth into swing space as their permanent space was finished. However, ARRA provided the project team with the opportunity and funding to find off-site locations to lease for the current occupants, leaving the building vacant during construction activities, which made the realization of a compressed construction schedule more realistic.   
5. 2. 1: Impact of Decision to use IPD on Project Costs   
Since the contracted time frame for the project compressed the project by about two-thirds of the time for typical project size, a primary motivator of the project to use an IPD was the need for schedule predictability.   
In regards to scheduling, IPD’s most critical impact is the Master Schedule (MS), a structured decision-making process that documents, sequences, and prioritizes the major tasks of the project. It was developed by the core team and evolved through each design phase as the team continued to identify all the major areas of work. This process is based on an open source philosophy, encouraging each team member to contribute to the task list and take ownership of an item (Roman & Michael, 142). The MS was broken down into several mini-Master Schedules (mMS) or work packages, with stand-alone deliverables, in order to detail how project would be carried out and how work would beprioritized.   
Finally, the co-location and use of BIM allowed for the team to utilizecollaborative decision-making and real-time coordination that allowed for all parties to be at the table and bring issues to the forefront.   
6. 0: Analysis and Recommendations   
6. 1: Is sustainable/smart building design a value add for gov’t employees and/or for taxpayers?   
In theory, sustainable, high-performance building design is a clear benefit for the future owners and occupants of building. The basic ideas fueling high-performance building and sustainable design are to reduce waste, conserve energy, and provide a better working environment for those that occupy the building which in turn leads to conservation of money and higher efficiency from workers. Given that EGWW has been and will be government owned and operated the transition to high-performance is well worth the expenditure to the American taxpayer. The expense to renovate the building will conceivably be recouped over time through energy savings, granted that time is likely many years. However, should the old building remained as is then it would have been at a loss to the taxpayer to keep funneling money into a building that was performing at a substandard level. Of course, this can only be said because the ARRA funding was going to be allocated somewhere and in some fashion. EGWW presented an opportunity that will potentially give back to not only the government, and hence taxpayer.   
The value to government employees should, again in theory, be a given by considering the basic principles behind LEED. However, the value can be substantiated as part of a requirement of LEED. A prerequisite for obtaining any LEED rating level is to obtain a minimum level of indoor environmental quality performance, and more specifically a minimum indoor air quality performance. Part of the prerequisite requires a survey of building occupants be performed after the building has been occupied for a designated period of time to get direct feedback regarding the space. As indoor air quality is one f the major contributors to occupant comfort, arguable what they would value most, this should provide a good indication of the overall value to the government employees.   
6. 1. 1: Strengths and Weaknesses   
We have discussed many strengths of sustainable and high-performance design practices, including worker productivity and reduced absenteeism, to overall energy savings and water use reduction. However, it should not go without saying that there is a broader human element to this all. Constructing a facility that reduces waste and conserves energy should theoretically improve the quality of life for neighboring communities and can be extrapolated out to include all of humanity in the long run. Locating the building near public transportation stops and promoting the use of fuel efficient vehicles should reduce traffic congestion and pollution. This is a grand idea and one that doesn’t come without criticism and detractors but the theory is solid.   
Conversely, there is a negative aspect that should be considered on an institutional level for the government when considering sustainable, high-performance design, and more specifically LEED. The USGBC provides a service to analyze and review the potential LEED project and with that service is obviously a cost. Given the government’s demand for green building practices across the board, it could be argued that it would be more cost effective in the long run for the government to establish its own standards to eliminate that use of taxpayer dollars. This analysis does however disregard the political debate that could be raged about American business, although, the USGBC is considered a non-profit. It also doesn’t take into account the cost for the government to oversee the process on its own, but that kind of in depth financial analysis is beside the point of this research.   
6. 1. 2: Opportunities and Threats   
There is an opportunity here to see EGWW as the flagship and subsequently the standard for government building projects moving forward. The restrictions and constraints set by ARRA required that the project team design and build a LEED building within a very tight schedule. Should the project be completed on time and on budget, and of course obtaining the LEED Platinum rating, and then it could provide a baseline example for implementing sustainable and high-performance design and construction on future GSA projects. This opportunity could be vital in a politicized world that always takes into account where and how taxpayer dollars are spent.   
Threats are harder to predict and could also be considered a part of the long range risk assessment for the project. Specifically related to the design aspect could be that the building fails to recoup the financials of energy consumption and, to some degree, the slightly less quantifiable worker efficiency.   
6. 2: Use of Accelerated Project Schedule   
Whenever a schedule is accelerated (shortened) the impact on a project team can be huge. More times than not, if things go wrong on a construction site they have a tendency to go very wrong. It’s the gamble we take with every project because work between project team members on a project, especially one of this magnitude are inherently interrelated. A ripple in one schedule causes a ripple throughout the entire construction/modernization project. At a minimum a project team can expect to take a hit on their initial cost estimate (hidden change order cost) as well as sign up for increased project risk. Sometimes it is desirable or in this case mandatory to accelerate a project schedule, regardless of the circumstances that drive an organization to initiate a project on an accelerated schedule it is vitally important the organization’s leadership come to terms with two very important prerequisites for doing so.   
1. Can the project be done given the organization’s Project Management Maturity Level?   
2. Does the budget support increased cost required to deliver the project within the new schedule and scope?   
In the case of EGWW it seems that GSA asked the questions and felt confident that they had the personnel and the funding to handle the accelerated project delivery schedule.   
6. 2. 1: Strengths and Weaknesses   
One of the obvious strengths of the EGWW modernization project was the ability to pull the earlier Design-Bid-Build work off the shelf; that, coupled with retaining SERA Architects made it much easier to modify existing designs rather than starting the entire process from scratch. Since every day counts and has a cost associated with it the more time whether days, months or years shaved off a project can be characterized as strength for accelerating the schedule. The timing of this project coincided with the appointment of a new GSA Administrator and Public Building Services Commissioner who placed a value on innovation, hence the organization was open to providing Project Managers the freedom to find new ways to deliver projects more efficiently.   
6. 2. 2: Opportunities and Threats   
A common request from Congressional House oversight committees and the American Taxpayers is “ Why Government Agencies can’t be run like a business”. Well, the accelerated schedule for not just the EGWW modernization project but a wide array of ARRA funded projects provided an opportunity to see to what degree private sector Best Practices could be applied to the Government Projects. The jury is still out on whether this is an acceptable model from which Government Agencies should operate but nonetheless the project provides a reference for future case studies to argue the point.   
The schedule also provided an opportunity to explore the use of new technologies such as IPD and BIM. A project like EGWW will have a significant number of stakeholders and the design is inherently full of nuances; as previously discussed GSA determined they needed IPD to deliver the project anywhere close to the accelerated schedule’s substantial completion date and they needed to make use of BIM technology to provide a common platform for conveying information. Both are typical problems for most projects within the private sector but given the P100/FAR regulatory requirements a typical GSA project would not initiate a project where the schedule dictates delivery method; usually, the schedule is changed to conform to methods and technology already in place. The project’s success or failure has the potential to introduce significant threats as well. If successful there may be a tendency for GSA to view this accelerated schedule as a new normal, forgetting the fact that in this instance some regulatory requirements were lifted and thus turning what was an accelerated schedule today into a baseline for future projects. The threat here is related to the volatile nature of construction projects in general (see Murphy’s Law) and the varying degrees of project manager capability within the organization (not all created equally). If the project happened to fail (not likely since the project is currently on schedule and on budget) the tendency is to throw out the good with the bad rather than dissecting the project as a whole to determine if certain elements are worth keeping.   
6. 3: Global Project Management   
6. 3. 1: Meet costumer need?   
If all project processes go according to plan, it is anticipated that the customer needs will be fulfilled since there are many advantages that are likely to be derived from this project. For instance, this project is likely to result in energy being saved since it is designed in a way that it uses modern technology that is efficient in term of saving energy. The project is also likely to meet the needs of the customers in that it is conveniently located in their area. Al l the people who may want to use the facility can easily walk to the place since it is closer to them. The other advantage that is likely to be derived is that congestion n in terms of motor vehicles will be significantly reduced since people can walk to the place. This also helps to reduce noise and air pollution in the area. The people in the area are set to benefit since the project can lead to a clean and peaceful environment.   
6. 3. 2: Proper stewardship of tax dollars?   
There are many benefits that can be derived from using high-performance building design such as reduction of waste as well as saving energy. In the long run, it can be seen that the tax dollars are going to be saved if the government designs buildings of this particular nature. Not only the tax payers money is going to be saved but efficiency in terms of employee performance is also going to be improved. Indeed, it may be expensive to build high performance buildings but the advantages can be witnessed in the long run. The government will significantly save the tax payers money through a reduction of maintenance costs. The tax payers money that is going to be saved from this particular project will be channeled towards other uses that will benefit the citizens of this state.   
6. 3. 3: Strengths and Weaknesses   
There are so many strengths that are likely to be derived from this high performance project in Edith Green Wendell WyattFederal Building modernization project (Portland, Oregon) . employee performance is likely to be improved since they will be working in an improved environment. Energy will also be save from this initiative which will help to save the tax payers money in the long run. The welfare of the residents in the area will be improved if there is a reduction of waste through this project. However, the major weakness is that the government should have its own standards that are designed to eliminate the use of tax payers funds.   
6. 3. 4: Opportunities and Threats   
The project schedule provides an opportunity to explore the use of new technologies such as IPD and BIM. These technologies can help improve the way similar projects are carried out in the future and these technologies also promote the creation of new knowledge. It can be seen that the likely threat can be related to project management principles that can be implemented bt the project managers. If these are not compatible with the project, they can negatively affect its success. However, it can be seen that the project is on schedule at the moment.   
6. 4: Summary and Conclusion   
The initiative to undertake the Edith Green Wendell WyattFederal Building modernization project (Portland, Oregon) is as noble one but a holistic approach ahs to be taken in order to accomplish the goals of this project. The envisaged benefits of this project after it has been successfully completed are quite numerous. For instance, energy will be save and a significant reduction in waste will also be witnessed. This in turn will benefit the residents in this area as well as the employees since their performance can be improved if they are working in a conducive environment. More importantly, it has been observed that the tax payers money will be saved as a result of the fact that little money will be required for maintenance of the building. However, the major constraint that has been observed is that the time frame set aside for carrying out this project is somehow limited. This may not be feasible to complete this project in 48 months since more time is required. It is therefore recommended that more care should be taken when implementing the accelerated project schedule. Otherwise failure to do that can negatively impact on the whole project.   
6. 4. 1: Implications for future projects   
As mentioned throughout this paper, ARRA funding placed two primary constraints on this project: its accelerated project schedule and required scope that the building be converted to a “ high-performance green building.” Both of these constraints provided GSA and the project team the opportunity to explore new project delivery technologies that vastly differed from the traditional contracting process used by government agencies.   
From the perspective of an outsider, the decision to use IPD to deliver the project makes sense. First, the motivations to keep the project on budget (cost predictability), on schedule (schedule predictability), and with little risk (risk management) are all benefits of IPD. Second, the design complexity of the project due to the accelerated time frame and the expected LEED certification demanded the integration of the project team, the design team, subcontractors and GSA leadership to increase coordination of project tasks—an advantage afforded by IPD. Finally, GSA saw this project as opportunity to become innovators and leaders in project delivery (i. e., market advantage), another key motivator of IPD. Currently, the project is on schedule and on budget, both strong indicators that the decision to use a new delivery method was successful—but does it mean that IPD should be used for all future projects?   
There is no doubt that this project provides a strong point of reference that GSA leadership and project managers can point to argue for the use of IPD. However, the very strengths and successes exhibited in the EGWW project could be very real and large threats to other projects:   
1. Regulatory Requirements. In order to meet the accelerated schedule that ARRA funding mandated, many of regulatory requirements were lifted or modified to allow the project to move forward. The adoption of an integrated approach for future projects will require a complete revision of the traditional contracting process, which would require a change in legislation. Any change in regulatory requirements could be lengthy, involved change due to political and economic factors and given the amount of input that would be needed from multiple stakeholders, there is no guarantee that revised requirements would allow for the full implementation of IPD.   
2. Buy-In. The use of IPD and BIM was strongly supported by GSA Region 10 leadership and the project team. In the RFP, contractors were required to submit recommendations for the first tier of sub-contractors, meaning that all applicants had to strongly support collaborative approach and an environment that encourage shared decision making. As a result, each team member and subcontractor had to support this environment and be comfortable working within it or risk being replaced on the project. Given the heavy emphasis that IPD places on having an effective team, projects run the risk of budget or schedule over-runs if a team does not effectively collaborate. In addition, future projects may not have the ability to allow contractors to recommend subcontractors, which may cause team formation to take longer due to the various team members having to learn how to work together.   
3. IPD as a process. IPD is not a tool or a piece of software that aids in project delivery. It is a process that relies on the buy-in and support of all involved in the project—and it relies on having a fairly mature project management structure due to the need to focus on designing outcomes through team collaboration, identifying trade-offs to optimize the schedule, and maintaining quality. 1 GSA Region 10 saw this project as a chance to maximize their leadership and innovation in the market and they saw IPD as a vehicle to do so; as such, their leadership and project manager bought into the process and worked to ensure that IPD process was ingrained in every aspect of the project execution. Future project would have to invest that same level of belief and dedication to the process of using IPD or may not have a mature enough infrastructure to fully execute the primary motivators of IPD.   
6. 4. 2: Contributions to body of knowledge for project management.   
As the EGWW modernization project was considered “ shovel ready,” meaning that many of the design documents had already been created, ARRA, if anything, may have helped create a sort of “ perfect storm” that allowed for GSA to conduct a full scale test of a new project delivery method within the strict mandates dictated by ARRA. In assessing the project as a whole, EGWW benefited greatly not only from ARRA funding, which guaranteed that it would be completed, but also from the start-stop-start again structure of the project as GSA was able to modify existing design with an already established design team—an advantage given the short 48-month project time. In addition, the drive evidenced by GSA leadership and the project team to see IPD succeed, as evidenced by the relaxing of some regulatory restrictions, buy-in from stakeholders, and seeing IPD as a process, contributed greatly to the project saying on budget and on schedule. However, in the same breath, it is important to raise some red flags—namely the decision-making process around the inclusion of LEED certification specifications versus other sustainability/high-performance building designs and any implications to future costs to maintain that LEED certification, the contracting procedures that did not enable a full integrated approach/collaboration, and whether the investment in IPD (as an approach and a philosophy) for this project will be able to allow GSA to become leader and innovator in project delivery or if IPD will simply be a “ one-off” project approach as GSA returns to “ business as usual.”   
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