USING AGILE COLLABORATIVE CONTRACTING PRINCIPLES FOR HOME IMPROVEMENT PROJECTS—PART II

Introduction

In the late Spring of 2020, a Business Owner (spouse) and Product Owner (myself) talked about possible home improvement projects (as many people were doing during this timeframe). The next major feature discussed was a deck renovation project. In fact, a neighbor remodeled their deck over a period of weeks, which looked quite nice. The Business Owner talked it over with other Business Owners who were accustomed to flipping houses (and had recently remodeled a deck) in order to conduct a preliminary risk analysis of prioritizing the deck project. After an initial Weighted Shortest Job First (WSJF) discussion and analysis, the Business Owner and Product Owner agreed to move the deck remodeling feature to the top of the Product Backlog. The Business Owner and Product Owner discussed some of the logistics involved and decided to procure the services of a Scrum Team (carpentry crew). Once a Scrum Team was identified, arrangements were made for the Scrum Master to come over to inspect the possible new Feature (deck remodeling) among other possible high-priority features on the Product Roadmap (needed home improvements). That is, the (candidate) Scrum Master had multiple specialties and wanted to suggest multiple features.

Backlog Grooming

The (candidate) Scrum Master arrived to survey the property and suggest multiple home improvements (Features) to the Business Owner and Product Owner. The Product Owner quickly diverted the (candidate) Scrum Master's attention to the deck remodeling (Feature). The Product Owner briefly outlined (possible) Product Vision for the Feature's (possible) Product Backlog—Elevator Speech. The Product Owner pointed the (candidate) Scrum Master's attention to the neighbor's recent deck remodeling project to provide a visual representation of the Product Vision throughout the initial discussion of the (possible) deck remodeling Feature. The Scrum Master was a bit hesitant, since he had never done a deck remodeling Feature before, and this discussion took over an hour to get a commitment to the (possible) Feature from the (candidate) Scrum Master. The Product Owner, although he had never participated in a deck remodeling Feature project before, carefully explained the possible steps (User Stories) involved in the project. The (possible) User Stories included removing the rails, floor boards, and steps, replacing all flooring with durable PVC materials, replacing rails with PVC materials too, painting any exposed surfaces to match the rails, hauling the old materials away (for disposal), and possibly even replacing some of the anchor bolts to the house. Because the (candidate) Scrum Master was not familiar with this type of Feature, he made frequent calls to the (candidate) Scrum Team to scope the size of the Feature in Story Points, Project Duration, and Labor Costs. The (candidate) Scrum Master was very uncertain about the Story Points and asked many questions over and over again. The Business Owner and Product Owner agreed to purchase and obtain all of the materials for the project. The Scrum Team merely had to remove the old materials and replace them with the new materials. After some perturbation, the (candidate) Scrum Master and Scrum Team agreed to begin work on the Feature on the next day. Although, the (candidate) Scrum Master expressed much uncertainty about the size and complexity, the Business Owner and Product Owner were very confident the Scrum Team could successfully complete the Feature with close Customer Collaboration, Customer Involvement, and Servant Leadership (and an initial price for the labor was agreed upon). The Product Owner agreed to shop for all of the materials that evening (determine the availability of the materials) and give the Scrum Team the final go ahead to begin working on the Feature if materials could be identified, located, and purchased by the next morning at 8:00 am.

Sprint Zero

The Product Owner immediately rushed to the local nearby home improvement store and began hunting for the supplies and materials for the deck remodeling features, although he'd never done such a project and had no idea what to look for. So, that was a bit of a risk to starting work on this Feature on the next day. The floorboard materials were quickly located, and the only question was whether enough flooring materials were in stock for the scope of the Feature. The Product Owner decided that there were indeed enough PVC floorboards in stock and began hunting for the other materials. The side rails were then located, but there simply weren't enough, so the Product Owner talked for floor salespeople and customer service, which assured the Product Owner the rails were indeed in-stock. After some haggling with floor salespeople, it was determined the rails were at the top of the aisles and had to be retrieved with a large forklift, which they did after about an hour. In the meantime, the Product Owner returned to customer service to rent a truck to deliver the floorboards and rails to the construction site. Customer Service informed the Product Owner that no truck rentals were available at this time, but the floor salespeople recommended renting a U-Haul truck for this purpose to which the Product Owner agreed. The salespeople finally lowered the rails from the top of the aisle on a large pallet and loaded them on a cart for the Product Owner, who purchased the rails and loaded them in his SUV. The Product Owner informed the Business Owner and (candidate) Scrum Master that all materials had been located and gave the Scrum Team the go ahead to begin work on the deck remodeling Feature the next morning. The Product Owner drove back to the worksite (home) and unloaded the materials with the help of the Business Owner and several other administrative personnel (son and nephew). The Product Owner then scoured the Internet for a U-Haul truck in the vicinity. This was quite a chore at this point, because it was short notice and there weren't many large enough trucks available the next morning to fit the bill of carrying the (long) flooring materials. After expanding the search region, the Product Owner located a U-Haul truck, synchronized its rental with the opening of the home improvement store, and rented it online. There were several major dependencies to other Features unrelated to the deck remodeling Feature that had to be worked out, but the Product Owner properly sequenced these dependencies with split second precision. It was going to be a tight schedule to coordinate the arrival of the materials with that of the Scrum Team.

Sprint (One) Planning.

The Product Owner then finalized the Sprint One Plan, which consisted of User Stories for Renting the U-Haul, Purchasing the Floor Boards, Loading the Floorboards on the U-Haul, Delivering the Floorboards to the worksite (home), Unloading the Floorboards, Returning the U-Haul Truck, Removing the Old Siderails, Removing the Old Floorboards, Installing the New Floorboards, Hauling Away the Old Materials, Keeping the Scrum Team Watered and Fed, Purchase Any Additional Materials the Scrum Team Needed, and Cleanup the Worksite. There were other Enabler Stories in the background like Repair the Fence.

Sprint One

The Product Owner got up bright and early, drove to the U-Haul site, rented the U-Haul truck, drove back to the home improvement store, loaded the new floorboards on a cart (which weighed over 500 pounds), purchased the materials, and loaded the new floorboards on the U-Haul truck as quickly as possible. The salespeople agreed to help push the 500-pound cart to the U-Haul truck and even used a forklift to load the materials into the back of the truck. The Product Owner drove back to the worksite (home), where the Scrum Team had already arrived and began stripping the rails and floorboards. The Scrum Team helped unload the materials, along with the Business Owner (spouse). The Product Owner then promptly returned the U-Haul truck to the rental location. An important note was that the Product Owner only had about two hours to rent the truck early that morning, pickup and deliver the materials, and return the truck to the rental location (as the truck was needed by 11:00 am that morning for another client). The Scrum Team often worked in pairs on each of the main User Stories throughout all Sprints. The first team of Pair Programmers (carpenters) stripped off the old rails and floorboards and loaded the old materials in the back of a pickup truck. Then, the next team of Pair Programmers arrived and began installing the new floorboards. The second team informed the Product Owner that more floorboards were needed as the Product Owner underestimated the number needed to complete the project. The Product Owner made the estimating error of using total area of the deck to determine the number of floorboards needed. However, the Scrum Team was aligning and cutting the new floorboards to the position of the support rafters, resulting in more Product Waste than the Product Owner anticipated. The Product Owner and Scrum Master quickly returned to the home improvement store to pick up additional PVC floorboards and other PVC materials for the siding. They delivered the additional materials to the worksite and unloaded them. The second team of Pair Programmers (carpenters) completed the installation of the new floorboards by the end of the first Sprint. The Product Owner kept the entire Scrum Team watered and fed and participated in the entire Sprint to participate in any necessary Wireframing, Spikes, Daily Standups, and other Conversations to remove any impediments that arose. Having participated in home improvement Scrum projects before in recent history, the Product Owner knew the importance of close collaboration and servant leadership throughout all Sprints to ensure the timely completion of the Feature. An unanticipated risk arose, as the second team of Pair Programmers realized the deck wasn't square, necessitating rail fasteners with a 45-degree angle. The Product Owner also assisted with the final User Story, which was to Cleanup the Worksite at the end of Sprint One. By the midpoint of the first Sprint, the Scrum Team realized the deck remodeling feature would take four Sprints, a little more labor and complexity than anticipated, and more labor cost as well. The Scrum Master requested a special Splinter Group Meeting with the Business Owner and Product Owner to request a little more money to complete the deck remodeling feature to which all agreed after some haggling. The Business Owner, Product Owner, and administrative assistant (nephew) spent much of the day trying to locate these special parts. The Product Owner facilitated a Backlog Grooming session with the entire Scrum Team for the next Sprint, participated in a Sprint Demonstration of the installation of the new floorboards, accepted the work, and reviewed the output of the Scrum Team's retrospective to ensure smooth execution of the next Sprint on the next day. As a footnote, it was the Product Owner's birthday, so the Product Management Team held a birthday celebration on the lawn during the late evening when the temperature cooled down quite a bit, which was very nice (in addition to fence repair).

Sprint (Two) Planning.

The Product Owner then finalized the Sprint Two Plan and reviewed it with the Scrum Team on the next day. The Scrum Team was comprised of the Scrum Master and the second team of Pair Programmers from the prior day. The User Stories consisted of Squaring Away the Main Deck, Installing the New Rails, Stripping the Staircase, Installing Pressure Treated Materials on the Stairs, Installing the PVC Floorboards, Keeping the Scrum Team Watered and Fed, and Purchasing Any Additional Materials.

Sprint Two

The Product Owner got up bright and early during Sprint Two, Scrum Master arrived, and then the second team of Pair Programmers (carpenters) arrived. The Product Owner and Scrum Team quickly reviewed the Sprint Plan for the day and determined more PVC siding boards were needed. So the Product Owner and Scrum Master drove back to the home improvement store to purchase some more PVC boards and related materials. The second set of Pair Programmers reviewed the Acceptance Criteria for the User Story consisting of Stripping the Staircase and decided it was simply too complex. The Product Owner wanted the removal of all of the old staircase floorboards, while the Scrum Team felt this was too laborious and beyond the scope, size, complexity, and cost of their estimated Story Points for the deck remodeling Feature. The Scrum Team constantly reviewed the scope of the User Stories and Tasks during regular Daily Standup Meetings and compared these estimations to the Release Date, Number of Working (Task) Hours, and Cost Parameters (Prices). The Scrum Team was very sensitive to any variations in scope, time, cost, and duration based on unanticipated risk, complexity, size, and uncertainty. After some negotiation, the Business Owner and Product Owner agreed that the old staircase materials could remain and be covered with PVC materials, which seemed to satisfy the Scrum Master and Scrum Team. The Scrum Team then labored to complete steps on the staircase and move on to installing the rails on the main deck. The Product Owner kept the Scrum Team Watered and Fed. The Scrum Team continued to be perturbed by the unanticipated scope, size, and complexity of the odd shaped deck in terms of additional Story Points throughout the first two Sprints. The Product Owner, having been accustomed to multiple home improvement Features in the last few years, kept on suggesting improvisations for mitigating the risk of the odd shaped deck to which the

Scrum Team rejected. The Product Owner was trying to remove this impediment and dependency upon special materials that regional home improvement stores simply did not carry. By the end of Sprint Two, the deck remodeling Feature began to take shape with the completion of the new PVC floorboards and staircase. The Product Owner and Scrum Master made one more trip to the home improvement store and brought some beer and soft drinks for the Scrum Team to consume (as they were tired of consuming bottled water). The Product Owner also assisted with the final User Story, which was to Cleanup the Worksite at the end of Sprint Two. The Scrum Master negotiated one more price bump (upward) due to the complexity of completing the staircase and the necessity of utilizing extra subject matter experts (SMEs) throughout the project to which the Product Owner agreed. Once again, the Product Owner needed to remove any risks, impediments, and dependencies that would get in the way of completing this Feature in a reasonable period of time. The Product Owner assumed the Scrum Team would work everyday until the Feature was completed, but the Scrum Master informed him that the Scrum Team needed a break until the final two Sprints to work on another project, to which the Product Owner agreed. The Product Owner facilitated a Backlog Grooming session with the entire Scrum Team for the next Sprint, participated in a Sprint Demonstration of the staircase and rails, accepted the work, and reviewed the output of the Scrum Team's retrospective to ensure smooth execution of the next upcoming Sprint.

Sprint (Three) Planning.

The Product Owner then finalized the Sprint Three Plan and reviewed it with the Scrum Team at the beginning of Sprint Three. The User Stories consisted of Painting the Exposed Surfaces, Installing the Pressure Treated Siding On Main Deck, Continue to Install Rails on the Main Deck, Installing the Stair Rails, Installing PVC Fenders on the Stairs, Keeping the Scrum Team Watered and Fed, and Purchasing Any Additional Materials the Scrum Team Needed. The Fence Repair Enabler was also needed.

Sprint Three

The Scrum Team showed up bright and early at the beginning of Sprint Three and began in earnest to Paint the Exposed Surfaces and Install the pressure treated siding on the main deck. Then, they Installed the Stair Rails, which was no easy task, and proceeded to Install PVC Fenders on the Stairs. On a side note, the special parts the Business Owner and Product Owner ordered arrived, but they were the wrong parts, which seemed to upset the Scrum Team that was a bit sensitive and perturbed about the current scope, time, and cost of the deck. The Product Owner continued to suggest workarounds to the Scrum Team to which they did not agree for installing the final set of rails on the main deck at a 45-degree angle. The Product Owner made several trips to multiple home improvement stores looking for alternative solutions for installing side rails at a 45-degree angle. The Product Owner Kept the Scrum Team watered and fed and made special trip at the request of the Scrum Master, because the Scrum Team was a bit bored with sandwiches from Subway, to which the Product Owner complied. While the deck remodeling Feature didn't seem very risky or complex to the Business Owner and Product Owner, and it was a rather small deck, it required a great deal of meticulous, time consuming labor that ate up a lot of day light very quickly. Midway through Sprint Three, the Product Owner started to get a little antsy about the Scrum Team's ability to complete the deck remodeling Feature by the Fourth and Final Sprint. The Product Owner made several more trips to the home improvement store throughout the day and even one final push to find the necessary parts to install the final set of rails on the main deck at a 45-degree angle. Once again, the Product Owner also assisted with the final User Story, which was to Cleanup the Worksite at the end of Sprint Three. As Sprint Three came to a close, the Scrum Team was thinking very hard to solve the issue of the installing the rails at a 45-degree angle during Sprint Four. The Product Owner facilitated a Backlog Grooming session with the entire Scrum Team for the final Sprint, participated in a Sprint Demonstration of the staircase rails and pressure treated siding, accepted the work, and reviewed the output of the Scrum Team's retrospective to ensure smooth execution of the final upcoming Sprint. On a footnote, the Product Owner scoured the Internet to identify the parts actually needed to fasten the main deck's side rails at a 45-degree angle, finally located them on a third-party site, and ordered them online (which took three Sprints to locate)—An unforeseen dependency.

Sprint (Four) Planning.

The Product Owner then finalized the Sprint Four Plan and reviewed it with the Scrum Team at the beginning of the Final Sprint. The User Stories consisted of Install the PVC Siding On Main Deck, Install the Final Set of Rails at a 45-Degree Angle, Complete Any Finishing Work on the Rails, Finalize Any Work on the Stairs, Keeping the Scrum Team Watered and Fed, and Purchase Any Additional Materials the Scrum Team Needed. The Product Owner also completed the Fence Repair Enabler in parallel.

Sprint Four

The Scrum Team showed up bright and early at the beginning of the Final Sprint. The Product Owner informed the Scrum Team that he'd purchased some possible parts, but they were not the correct ones. He also informed the Scrum Team that he ordered the correct parts on the Internet, but they would take another week to arrive. The Scrum Team then suggested an improvisation for installing the final set of rails on the main deck to which the Product Owner agreed. The Product Owner had been suggesting out of the box thinking all along, to which the Scrum Team finally succumbed out of a desire to complete the deck remodeling Feature at the end of Sprint Four. They installed the PVC siding on the main deck, completed the work on the stair case, installed the final set of rails on the main deck at a 45-degree angle, which they could have done during Sprint Two (had they been thinking out of the box at that earlier stage). They finalized all work on the main deck and staircase, cleaned up the worksite, and took on an extra User Story to haul away any extra refuse from the yard. On a footnote, it was no easy task to carry off all of the refuse after each Sprint, which required a trip to the nearest landfill. The Business Owner and Product Owner agreed to put on any finishing touches like fastening any post caps with adhesive. Of course, the Product Owner kept the Scrum Team watered and fed throughout the Final Sprint. The Business Owner and Product Owner, along with the entire Scrum Team, participated in a Final

System Demonstration and Release of the deck remodeling Feature after Four Sprints, which looked very nice! It was a fairly significant cleanup afterwards, and both the Scrum Team and Product Owner took photographs for posterity. The Business Owner and Product Owner made final payment to the Scrum Master, along with the price increases, and dismissed the Scrum Team for the final time. The Product Owner performed any final cleanup necessary to ensure the yard was in-shape for the next day's activity. The Product Owner also prepared a final budget of the entire project, reconciled all receipts to credit card purchases, and prepared a final report of the deck remodeling Feature project. The Fence Repair Enabler was also a major lift during the Project.

Analysis and Lessons Learned

Although the scope, size, and complexity of this deck remodeling Feature wasn't as complex as the last major Feature the Business Owner and Product Owner undertook, it did seem to have its own set of risks, interdependencies, complexity, and challenges. The Business Owner and Product Owner were accustomed to applying Scrum values, principles, and practices to home improvement projects. However, this Feature was new to everyone, including the Business Owner, Product Owner, and Scrum Team. Perhaps, the Business Owner and Product Owner were a little too overconfident and eager and sort of pushed the reluctant Scrum Master and Scrum Team into this endeavor kicking and screaming to some degree. The last Scrum Team with whom the Business Owner and Product Owner worked were already familiar with one another, there was some built in trust and a strong working relationship, and they were accustomed to taking on large Features and small User Stories over the last few years together. However, this was a new Scrum Team without a history, relationship, and trust. The last Feature had a clear milestone or deadline the Business Owner and Product Owner needed to meet. However, the deck remodeling Feature did not have a clear milestone or deadline. Nonetheless, the Business Owner and Product Owner sort of bull rushed the Scrum Master and Scrum Team a bit before they were ready to commit to a Vision, Feature, and Backlog of this scale, scope, complexity, cost, and magnitude. The Business Owner and Product Owner had no ill will towards the Scrum Team—They just wanted to git-r-done at a reasonable price. Overall, the project was quite expensive, and two thirds of the budget went to new materials. In the end, through inadvertent incremental purchases, there was very little waste left over afterwards. The last home improvement Feature was on-budget but took twice as long as initially estimated. The deck remodeling Feature completed on time, and even faster than the neighbor's deck remodeling feature, but it cost a little more than anticipated in terms of labor and materials costs. Nonetheless, the deck came out very nicely and all stakeholders were pleased with the business value and outputs of the Scrum project. All in all, it was best to have an independent Scrum Team complete this project, because although it looked simple on the outside, and many people are willing to take on this kind of project alone, it had a lot of hidden complexity requiring advanced carpentry skills. Of course, the application of Agile Values such as Customer Collaboration, Individuals and Interactions, Working Software (Completed User Stories), and Responding to Change were paramount to success, along with the use of Scrum itself.

- Upfront discovery and scoping activity with the supplier in-advance.
- Low-risk, tightly-scoped Minimum Viable Product (MVP) with low complexity.
- Extended upfront Sprint Zero to acquire all of the necessary supplies in advance.
- Allowing the supplier to choose the start and end dates and times (within our window of opportunity).
- Constant, rich high-context communication, collaboration, presence, and participation with the supplier.
- Full-time commitment to facilitation, oversight, management, coordination, and completion of the project.
- Real-time Business and Product Owner involvement to remove impediments to optimize velocity and flow.
- Embodiment of Servant Leadership skills to take ownership for personally completing indirect and direct tasks.
- Dependency management, coordination, and communication for proper sequencing of Features, User Stories, and Tasks.
- Going the extra mile to lend a helping hand, solve problems, and provide all of the resources necessary to complete project.
- Continuous improvement to identify emerging patterns, establish mitigation plans, and implement actions to ensure success.
- Empowerment of suppliers with equal decision-making rights, risk/workload sharing, emergent design, and scope adjustments.

Summary

As indicated, in the late Spring of 2020, the Business Owner (spouse) and Product Owner (myself) agreed that a deck remodeling Feature was the next highest priority home improvement project. So, the Business Owner did some discovery and found a supplier, the Product Owner prepared a Vision and Product Backlog and communicated it to the Scrum Team, and the Product Owner quickly purchased the initial supplies and secured a commitment to a hard start date. After some initial perturbation, the Scrum Team agreed to the terms and conditions of the Scrum Project and began work in earnest. They used their carpentry expertise to work out the meticulous details, perform Daily Standups and Scrum Ceremonies, and keep the Product Owner apprised of emerging risks, impediments, and cost increases. Based on prior experience with Scrum-based home improvement projects, the Business and Product Owner worked closely with the Scrum Team to remove and resolve all risks, impediments, and dependencies to keep the deck remodeling Feature on track. In the end, the deck came out very nicely and all stakeholders were deeply satisfied. Based on close observation and comparison to our neighbor's deck remodeling project, we completed this in about one-fourth the time for one half of the cost with the application of Scrum principles. *A traditional manager would have spent four Sprints producing a project plan, integrated master schedule, enterprise architecture, and business requirements*.

Further Resources

- Rico, D. F. (2018). *Lean & agile contracts*: *21 principles of collaborative contracts and relationships*. Retrieved June 29, 2018, from http://davidfrico.com/collaborative-contract-principles.pdf
- Rico, D. F. (2019). *Using agile collaborative contracting principles for home improvement projects*. Retrieved March 30, 2019 from http://davidfrico.com/scrum-case-study.pdf

Using Agile Collaborative Contracting Principles for Home Improvement Projects—Part II—Final System Demo