Scrum Is Not Just for Software

A real-life application of Scrum outside IT.

Robbie Mac Iver

2/9/2009

.

Agile methods like Scrum can be applied to any project effort to deliver improved results in ever evolving business environments, and do so in a manner that demonstrates visible, predictable progress toward today's most important business priorities

Scrum Is Not Just for Software

By Robbie Mac Iver

Traditional project management methods often approach all projects in the same plan driven manner regardless of the level of uncertainty and change represented by the project. As a result projects fail to meet their anticipated business objectives and overall confidence in the team's ability to deliver is lost. Agile methods are becoming well established to address these issues in software development efforts, but agility is not just for software. Consider this definition of agility from Jim Highsmith:

> ➢ *Agility is the ability to both create and respond to change in order*
> *to profit in a turbulent business environment.*
> - Jim Highsmith, Agile Project Management

This does not speak to software development at all; but rather to addressing change (and uncertainty) in ways that bring business benefit even though the business environment is ever changing.

Agile methods like Scrum can be applied to any project effort to deliver improved results in ever evolving business environments, and do so in a manner that demonstrates visible, predictable progress toward today's most important business priorities.
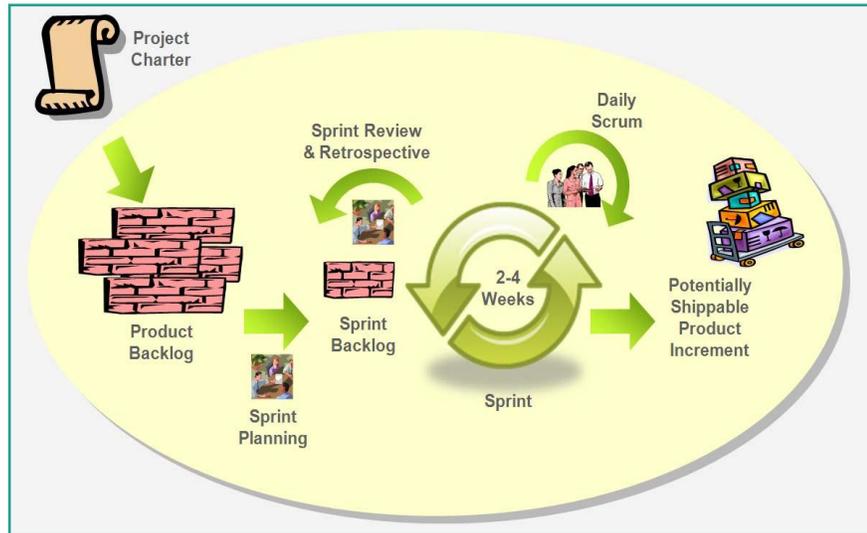
Scrum Overview

While most often associated with software development efforts, Scrum is a project management framework not a software development life cycle and is ideally suited for projects with high uncertainty.

Scrum Characteristics	Sprint or Iteration Characteristics
- Delivers iteratively via Sprints - Incrementally Delivers Business Value - Encourages High Customer Involvement - Promotes Continuous Improvement	- Timed Boxed Period - Fixed Start and End Date - Focused on Short-Term Goal - Maintains a Sustainable Pace

The Scrum Lifecycle

A Scrum project starts like any other project; with a project chartering or visioning session that defines the business case justification and the high-level scope of the project. In Scrum this is called the Product Backlog. Unlike traditional methods, in Scrum the Product Backlog is not viewed as the final scope but is expected to evolve as the project proceeds and more is learned about the business issues being addressed and the solution needed.

Sprint planning sessions are then used to select work from the Product Backlog to be completed in the next sprint, forming the Sprint Backlog. The team then executes the sprint which is typically 2-4 weeks and produces a "Potentially Shippable Product Increment".   In a software development effort this is one or more features on which feedback from the Product Owner and other stakeholders is sought. Daily Scrum meetings, also known as Daily Stand-Ups, are used throughout the sprint to coordinate the work and keep the team focused on the sprint goals. A Sprint Review is conducted at the end of the sprint to assess the work done during the sprint and demonstrate the completed work. Finally a Sprint Retrospective is conducted to review what went well and what did not so that the appropriate adjustments can be made when planning the next sprint.

To see how Scrum can be used in settings other than software development, let's consider a sample business case that is based one of my recent client experiences.
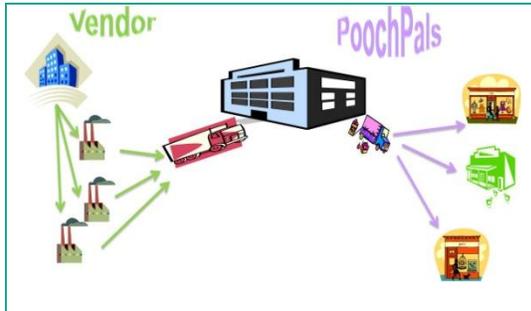
An Example Business Process

PoochPals[1] is a national corporation that provides supplies, food, toys, medicines, and a vast array of other products to the nation's most pampered pets (through

---

[1] Not intended to represent any real company.

their owners of course). The company actually manufactures nothing. It buys these products from a large number of vendors all over the country and then distributes them for resale to pet related businesses everywhere.

Figure 1 shows a sample supply chain network. To get a feel for

Figure 1. Sample Supply Chain Network. Vendors transport products from multiple manufacturing & distribution locations to a PoochPals warehouse. Products are then shipped (based on demand) from the PoochPals warehouse to customers.

the complexity involved, multiply this by 500 or so vendors and you can see that supply chain optimization is a big deal for companies like PoochPals.

As its product line expands, its customer base grows or its product demand shifts from one geographic area to another, PoochPals optimizes its supply chain in a number of ways. One the most involved is opening an additional warehouse to serve particular geographic market. While adding a new warehouse is an immense effort from many standpoints, the one we want to consider is the effort that determines which vendors, products and customers will be serviced by a new warehouse. This is not a trivial endeavor as it could involve hundreds of vendors and thousands of products. The end to end process takes approximately 6 months per vendor and requires a team of 50+ people from multiple business areas.

At a high level the process might look like this:

- Selecting vendors and products
- Gathering and validating specific product information
- Designing the supply chain for each vendor
- Negotiating vendor contracts
- Building-up the initial product inventory at the new warehouse

The Traditional Approach

The traditional approach (see Figure 2.) puts together a very detailed project plan that defines all the various tasks in each of the above process areas. This could amount to several hundred tasks that need to be performed for each vendor. Imagine creating that detailed plan and concurrently managing some 200+ vendors independently. Instead we might create groups of 10-15 vendors to manage together. Finally we set a schedule based on the management's goal for stocking the initial inventory at a pace the warehouse can accept. From there the existing replenishment processes take over to maintain the necessary inventory levels based

on customer demand, but those processes are not considered in the scope of this discussion.

The underlying assumption here is that the effort for each vendor is the same; or that the differences between each vendor in a particular grouping would "even out". It's the "wishful thinking" assumption, and we all know how that generally works out.

In reality (see Figure 3.), the effort for each vendor could be vastly different from one another.
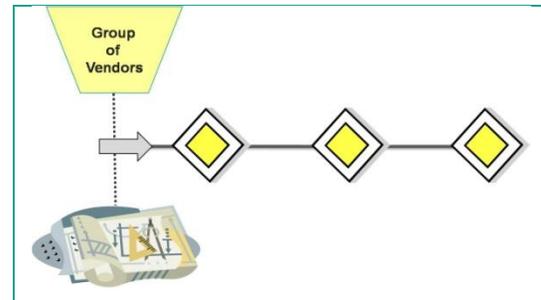
Figure 2. Armed with the detailed project plan, traditional project management practices push the group of vendors toward the various milestones defined in the plan.

- First each vendor's capacity or willingness to cooperate is different so in some respects, the vendor actually has more control over our schedule then our plan would indicate.
- Second the work required for a vendor from which I buy one product from one location is quite different from that for a vendor from which I buy 500 products from 15 different locations.
- Third, some vendors will not make it through the process; or may make it through with a reduced product selection. None of these differences may be well-known when the arbitrary vendor groupings are made.
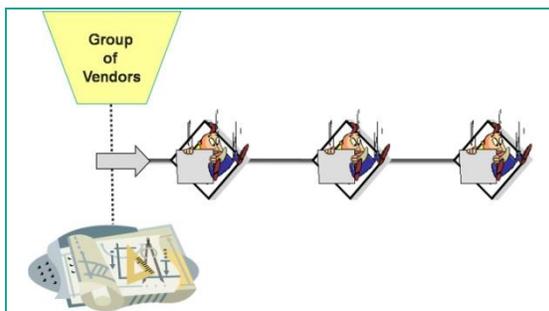
Figure 3. Milestones soon become meaningless and the team is in free-fall.

Inevitably, when a particular milestone date in the plan is reached for the vendor group, some work has not been completed for one or more vendors in the group. Thus begins a massive change management effort of moving those vendors to some later group or "tweaking" the milestone date in the belief the team can catch up with the errant vendors.

The end result is that progress toward the end goal of building up the initial warehouse inventory is slowed, but not in a particularly visible way. Perhaps you have also notices that this end goal itself is not very visible (we haven't actually even mentioned it yet), and the team is certainly not focused on it. They are focused on completing some set of tasks by the prescribed date, and the decisions they make are aimed at meeting the date, not reaching the all but invisible end goal.

How Can Scrum Help?

The Scrum framework offers a better way to approach this process and manage the inherent uncertainty and change in this type of effort. Without actually changing the day-to-day work tasks that the team needs to complete, Scrum allows us to change how the work is organized and measured to:

- Focus the team on the real business value
- Clarify the work streams and the alignment of the team
- Enforce what "done" means
- Make progress and issues visible (sometimes "painfully")

What is the Real Business Value?

First of all we have to recognize what is important and focus the team on that. Is performing a certain set of tasks by a prescribed date what is really important? That is really the means, not the end. The end goal is to build-up the product

Product Volume

52 Million Cases Yearly

Within Six Months
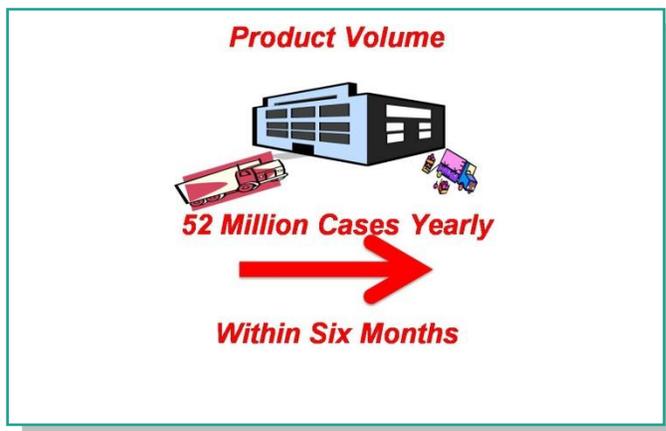
volume moving through the new warehouse to the desired level by the desired date. This is a primary driver in the business case for opening the warehouse in the first place; but it is not what the team is focused on. So let's focus the team on it.

For our example let's say the goal is to have 52 million cases of product flowing through the warehouse annually and to reach that rate within 6 months of opening the new facility[2]. Now the team has a goal against which it can assess the progress that it makes.

Validate Work Streams

Next we want to work in time-boxed sprints so we can assess our progress and benefit from frequent feedback to adjust our planning and processes. So let's assume our sprints are two weeks long. It is likely obvious that all the work for a

---

[2] As you might expect the true business goal is financial. This information however was held in strict confidence by the client's executive management and was therefore converted to product volume for the teams.

single vendor cannot be completed in a single two week sprint so we therefore divide the work into finite work streams so that the work of any one work stream can be completed in a single two week sprint, at least for most vendors.

In our case the work streams might be:

- Product Validation – determine vendor products; gather and validate specific product information
- Supply Chain – analyze and define the optimal supply chain network for the vendor
- Contract – negotiate a contract with the vendor
- Fulfillment – buildup the initial product inventory at the warehouse and enable the standard replenishment processes
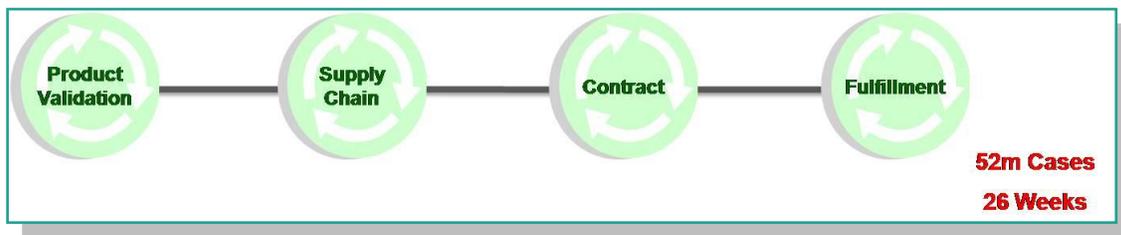
Define Sprint Goals

Next the team members are aligned to the various work streams in accordance to each person's area of expertise and the needs of each work stream[3]. Each of these teams can be considered a Scrum team and as such each team is accountable to meet
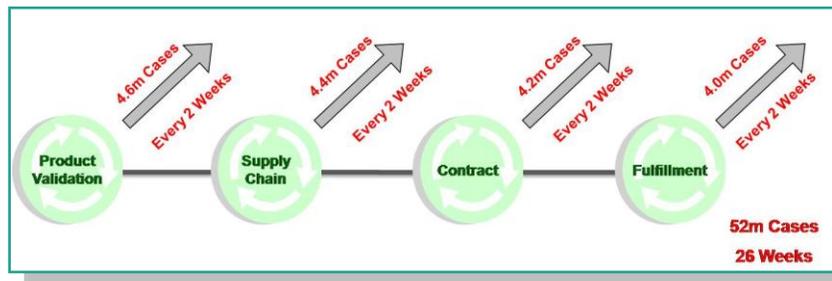
their sprint goal every two weeks. Staying with the assumption of two week sprints we will have 13 sprints (6 months = 26 weeks / 2 week sprint = 13 sprints).

The sprint goal for the Fulfillment team is set at 4 million cases per sprint (52

---

[3] Structuring these teams as small cross-functional teams who collectively have the ability to move a vendor through the process end-to-end is likely more in keeping with Scrum. The team alignment above however was chosen to recognize the distinct nature of the work and the requisite skills of each work stream, make it easier to determine sprint goals appropriate for two-week sprints, and avoid what would have been a significant cultural shift for this client organization that could have derailed the project.

million case goal / 13 sprints). That means every two weeks the Fulfillment team is expected to increase the product volume moving through the warehouse by 4 million annualized cases. Finally, because there is a history of vendors being eliminated from the program at various points in the process, the sprint goals for each preceding team are increased as shown in the drawing above. This accounts for the expected vendor attrition and ensures the end goal of 52 million cases is met.

What Does "Done" Mean?

Scrum teams also need to agree upon what "done" really means. Again in a software development effort we expect the team to produce a "potentially shippable product increment" by the end of each sprint. In our case each team defines a Checklist that details the work tasks that must be complete before the downstream team can begin their work for the vendor. The Product Validation team for instance defines the Checklist of work that must be completed prior to the Supply Chain team being able to start work on the same vendor. This also means that the Supply Chain team defines their prerequisites as a part of the Product Validation team's checklist.
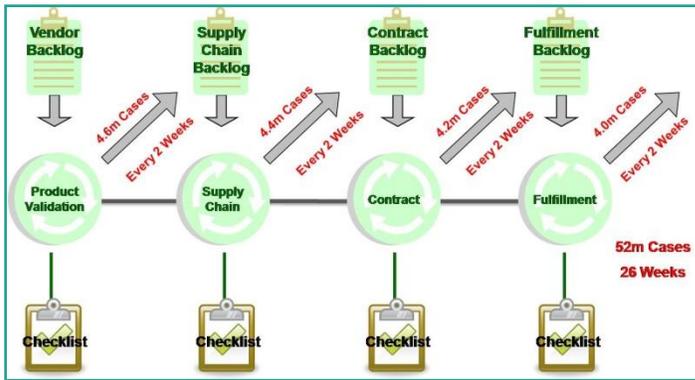
"Done" is then defined as completing the work on the checklist for a selected vendor. If everything is complete at the end of the sprint, the product volume for that vendor counts toward the sprint goal. If the work is not complete, none of the product volume for the vendor is counted toward the sprint goal. It is a very black-and-white; all-or-nothing assessment that clearly states progress toward each team's sprint goal and by transference the overall team's progress toward the end goal of 52 million cases.

Scrum teams work from the Product Backlog. In a software development effort backlog this is the list software features or user stories maintained by the product owner. In our case the Product Backlog is the list of vendors which are ready to enter the team's work stream. The backlog would also record any pertinent information the team wanted to know about the vendor such as the anticipated case volume or number of products.

A Simulation of Sprints

So let's see how this works.

Sprint 1	▪ Only the Product Validation team can work in this sprint. [4] ▪ In the Sprint Planning meeting the team selects vendors from their Backlog to meet their case volume goal (4 million cases for example). ▪ Daily Scrums keep the team's focus on the sprint goal during the sprint. ▪ During the Sprint Review the team assesses which vendors are completed and records the number of cases completed toward their goal. ▪ The completed vendors are placed on the Supply Chain Backlog. ▪ Finally the Sprint Retrospective looks at the completed sprint to assess how the team can improve in the next sprint.

Remember the challenge to the team is no longer "*take this group of suppliers and perform these tasks by those dates*". The challenge is "*in the next two weeks complete the work on your checklist for vendors totaling X million cases of product; working with which ever vendors you think can support meeting this goal*".

Sprint 2	▪ The Supply Chain team can now begin work. ▪ In their Sprint Planning meetings each team selects vendors from their Backlog to meet their respective sprint goals. ▪ Daily Scrums keep the team's focus on the sprint goal during the sprint. ▪ During the Sprint Review each team assesses which vendors are completed and records the number of cases completed toward their goals. ▪ The completed vendors are placed on the Backlog of the downstream team. ▪ Finally Sprint Retrospectives look at the completed sprint to assess how each team can improve in the next sprint.

The Contract and Fulfillment teams start work in Sprint 3 and 4 respectively and follow the same sprint planning, executing, and reviewing process. All teams continue working in sprints until the business goal (52 million cases) is met. The actual progress made by each team will determine how many sprints are really needed.
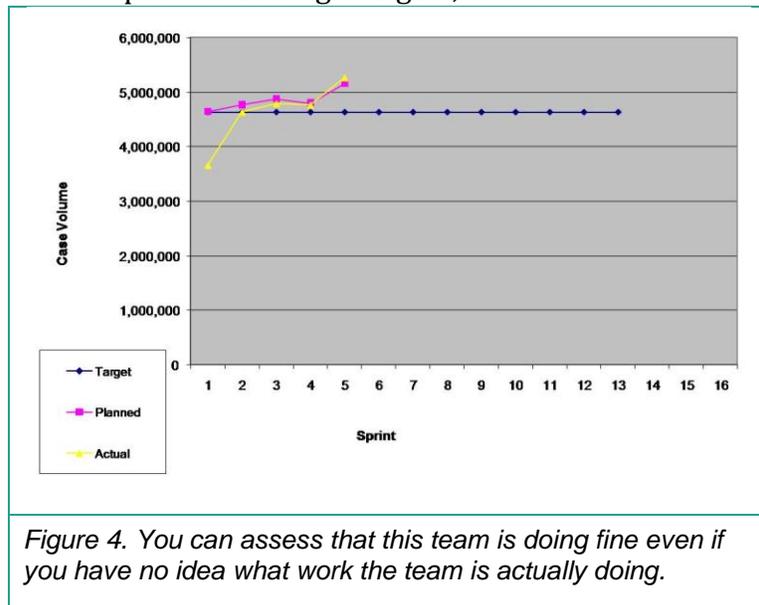
---

[4] No other team has vendors on its Backlog at this point in time.

Measurements

Simple tools such as an Excel Worksheet can be used to record each team's sprint goal as well as the actual progress toward that goal. Agile teams often use simple charts like the ones shown here to make progress to the sprint goal very visible. Often called Information Radiators, these charts are often posted in public areas or made available on a team web site for all to see. Nothing is hidden or masked about the team's actual progress.

In Figure 4, the blue line represents the target leading to the 52 million cases in six month goal. Since the teams had no input into setting this goal, each team was asked to set their own plan number at the beginning each sprint. This provided a goal for which the team felt accountable and is shown in pink. The yellow line shows the actual case volume completed. At a glance you can see that the Product Validation team is setting goals close to the target and after the first sprint they are achieving their goal.

Figure 4. You can assess that this team is doing fine even if you have no idea what work the team is actually doing.

In contrast (Figure 5.), the Contract team is having serious difficulty. Just from looking at this chart we know the team needs help[5].

It could be that the team just needs assistance in figuring out how to do its work. Or perhaps the team is missing a key skill set and the team makeup needs to be altered. It could also mean that the team is working well and the sprint goal is just not reasonable. In that case perhaps we need two contract teams to achieve this goal, not one. Whatever the case, as project managers we can very easily determine where our focus is needed to ensure the project moves forward in a way that will meet the overall business goal.

---

[5] We also know even without looking that the downstream team can't possibly be meeting its goal either. It does not have sufficient vendors on its backlog to do so.

Because we can judge the team's "velocity" at the end of each two-week sprint, we can reasonably project the overall schedule. If for instance, the Fulfillment team is only able to achieve 3 million cases per sprint rather than 4 million, then we can

project that 17 or 18 sprints are needed, not 13 (52m cases divided by 3m). If the team's velocity is 5 million cases per sprint, then we know we need only 10 or 11 sprints. Not only is this

Figure 5. This team is having serious difficulty.

projection based on the reality of the team's actual performance, it can be reliably assessed after the first few sprints and monitored thereafter. No more waiting 4 or 5 months into a 6 month project to recognize we won't make the date.
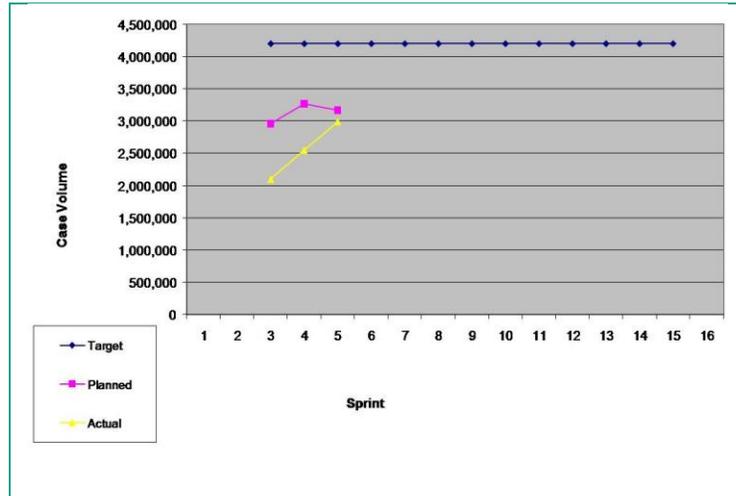
What Has Changed?

Remember that we made no changes to the work the team needed to do or how to do it. What changed was how the work was organized and measured, which made the teams accountable for achieving a business goal, not just simply meeting a date.

Before	After
▪ Vendors were arbitrarily pushed through the process.	▪ Vendors are selected by the team and pulled through the process.
▪ Vendor "moved" through the process to meet the plan.	▪ Vendor "moves" through process at its own pace
▪ All planning was done upfront.	▪ Planning is done continuously at sprint boundaries.
▪ Team was accountable for "meeting the date".	▪ Team is accountable for meeting the business goal (x.x cases every two weeks).
▪ Attainment of business goal was obscured.	▪ Attainment of goal "painfully" visible
▪ Impact of decisions on business goal not clear.	▪ Impact of decisions on business goals is immediately visible.

In Summary

In my client's experience, the team struggled to meet the overall product volume goal for the first few sprints. But four things were true that were not true before:

- They immediately knew they were not meeting the goal.
- They knew precisely how far they were from meeting their goal.
- By seeing which teams were not making their team goal, they knew why they were not meeting the goal.
- Teams took more accountability for the goal and adapted their work stream processes to improve their ability to meet the goal.

Eventually the team satisfied executive management's business goal for the new facility. We also met a goal for the Project Management Office of reducing the number of project managers overseeing the process from six to two.

As we recognize that our projects have a high degree of uncertainty and change, we should not shy away from looking beyond the traditional project management processes to embrace and manage that change. Agile methods such as Scrum can offer inventive solutions that can bring order and reason to otherwise chaotic environments. Focus the team on the true business goal, position the team to organize their work in ways in which the meaning of "done" is clearly understood, measure the team's progress in terms of attaining some portion of the business goal, and free the team to seek and react to feedback that will help continuously improve both its performance and its processes in order to meet the real business objective.

As an IT Project Manager and Agile Practitioner and Coach Robbie Mac Iver is adept at bringing business and technology teams together to create and implement innovative solutions to complex business opportunities.

- ➢ *PMP Certified*

- ➢ *Certified Scrum Master (CSM)*

- ➢ *Co-Founder of APLN Houston*

rmaciver@swdecisions.com ♦ *www.swdecisions.com* ♦ *www.swdecisions.wordpress.com*