

## A New View of Constraints:

### Doing More Than Balancing the Traditional Triple Constraints

By Darrell G. Stiffler, PMP

## Defining Constraints

One of the key processes for a project in the past was the solicitation and elicitation of the customer and stakeholder's preferences with regards to project deliverables. In the past, eliciting (identifying, classifying, documenting) the desired deliverables and identifying the flexibility of the constraints associated with that deliverable was equally important. The eliciting of the desired deliverables is still very important. However, identifying the flexibility of the constraint has now changed to balancing the constraints. A constraint, as defined by the *Guide to the Project Management Body of Knowledge® (PMBOK®) Guide 4<sup>th</sup> Edition* is:

*“The state, quality, or sense of being restricted to a given course of action or inaction. An applicable restriction or limitation, either internal or external to a project, which will affect the performance of the project or a process.”*

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A simpler definition for constraints is “anything that prevents the project from achieving more of its goal.”

In past publications, the *PMBOK® Guide* has used the Triple Constraint Model to demonstrate constraints in a project. The Triple Constraint Model is not referenced in the *PMBOK® Guide 4<sup>th</sup> Edition*. Instead, a new approach to constraints is mentioned.

Page six of the *PMBOK® Guide 4<sup>th</sup> Edition*, states:

*“1.3 What is Project Management?”*

*Managing a project typically includes:*

- *Identifying requirements,*
- *Addressing various needs, concerns, and expectations of the stakeholders as the project is planned and carried out;*
- *Balancing the competing project constraints including , but not limited to:*
  - *Scope,*
  - *Quality,*
  - *Schedule,*
  - *Budget,*
  - *Resources, and*
  - *Risk”*

## A New Constraint Model

In the absence of the Triple Constraint Model, and with the publication of the new six constraints reference in the *PMBOK® Guide*, I have taken these new references and coined a new constraint model. On October 16, 2009, I performed a Google search and did not find any reference to this concept. Therefore, I am coining this concept as the Stiffler Hexagon Constraint Model® (SHCM®). What I have constructed (see Figure 1) is a hexagon node and labeled the legs with each of the six constraints named in the *PMBOK® Guide*. I do not know if the Project Management Institute (PMI) listing order of the constraints has any significance. It is my belief that the constraints should be listed in a specific order of consideration, although all constraints should be considered equally. I believe that the order of consideration should be:

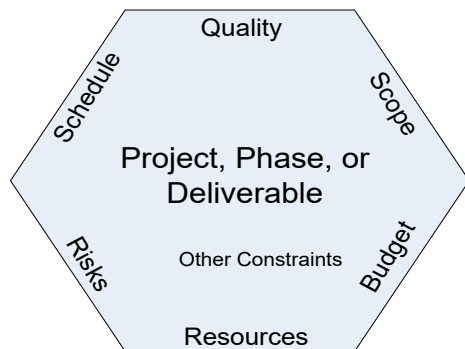
- Quality
- Scope
- Budget
- Resources
- Risk
- Schedule

It is customary to start at the top of the model and read in a clockwise direction. Therefore, I have labeled the legs in consideration order. In addition to labeling the legs of the hexagon, I have added the words “Customer Satisfaction” to represent that the setting of priorities of the constraints must be with the customers approval and dealt with to their satisfaction.

Another, what appears to be subtle change, is that now the *PMBOK® Guide* speaks of “balancing the competing project constraints” when dealing with the Triple Constraint Model. The *PMBOK® Guide* speaks in terms of a “framework for evaluating.”

Do not forget that on page six the definition also states “but not limited to;” therefore, we must mention other constraints may be present in your organization. Those limitations may be: locations, technology, standards, etc. I have noted “Others” on the model to open the possibilities for constraints unique to a specific project.

Stiffler Hexagon Constraint Model™



Customer's Satisfaction

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Figure 1

When considering other constraints it would be prudent to analyze if the constraint is real or perceived. It has been my experience that in many organizations there are perceptions of constraints that are conjured up by past experiences or previous resources. “It has never been done so we can’t do it now” is a common response by employees and management when in fact, new resources have been added or could be added for a particular project that will make the stated approach viable at this time. The project manager (PM), along with the key stakeholders, should make their best effort to validate all suggested constraints, bearing in mind that one can take the approach of elevating the constraint to a point where it is no longer a constraint.

I have further illustrated the concept of the constraint model by creating a Work Breakdown Structure (WBS) using the SHCM® (see Figure 2). I believe using the SHCM® WBS cleverly illustrates a real life scenario of how a WBS works. From the project and phase level the SHCM® WBS illustrates that key stakeholders must consider the impact of the six constraints. It further illustrates that on the deliverable level, should one of the six constraints change, not only does the change affect the deliverable directly but also it affects the phase as a whole. Therefore, it is imperative to give equal consideration to all six of the stated constraints plus any additional constraints that may be applicable to a particular project.

The model in Figure 2 illustrates how an equally balanced SHCM® WBS would appear. The beauty of the hexagon is that when all sides are equal, the module fits nicely together, demonstrating a flawless, solid cohesive model.

### Stiffler Hexagon Constraint Model™ Applied to a Work Breakdown Structure

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10/16/09

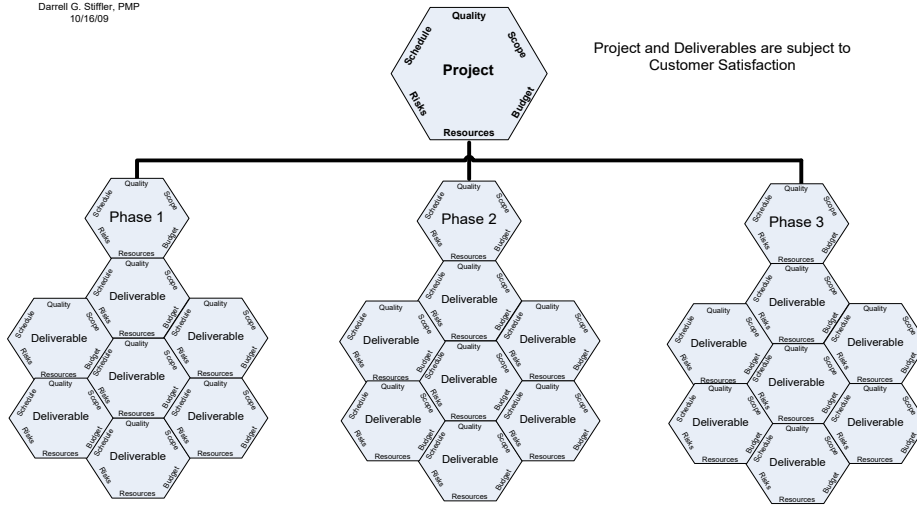


Figure 2

The model in Figure 3 illustrates how the effect of not balancing the constraints would appear.

### Stiffler Hexagon Constraint Model™ Applied to a Work Breakdown Structure

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Corrupted WBS,  
Results When  
Attention Is Not  
Paid To Balancing  
Constraints

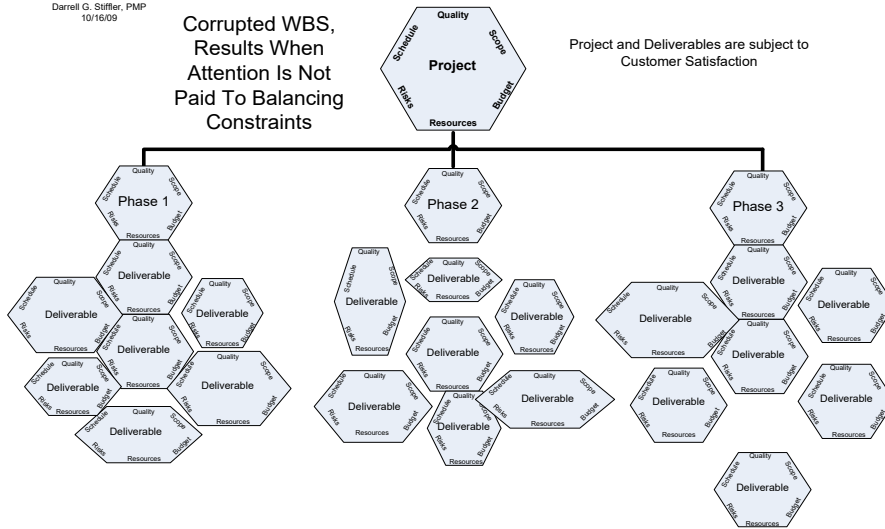


Figure 3

## Six Constraints

Let us examine each of six constraints on an individual basis. One must remember that as progress is made from one constraint to the next, it may be necessary to repeat the process, therefore making the process iterative. For example, one may establish the original quality and define scope only to discover that the budget constraint will not support the level of quality originally established. Therefore, the quality and scope must be revisited.

- **Quality:** It is my belief that quality should be the first constraint considered, after the high-level description of the deliverable (product, service or result) has been established. I have experienced situations where quality is almost an afterthought in project management, but I think most of us agree that quality should be the predominant consideration. It seems odd that a PM's performance is measured by schedule and budget compliance, when the level of quality is the primary concern of the customer. What value does a deliverable have if it is not usable or is not durable? This is not to say that every deliverable has to be of the highest quality, but it must be a level of quality that is acceptable to the customer (meets the customer requirement or specification). Not only should the quality of the deliverable be defined but also the quality of the resources to be used in creating the deliverables. For example, production may require equipment with more accurate tolerance or employees with different capabilities than what is currently in use.
- **Scope:** Now that the quality of the deliverable has been established, the PM must craft the WBS. The necessary activities to produce the deliverables and sub-deliverables must be defined. Should the quality of the deliverable(s) change, then the scope activities must be reviewed and adjusted.
- **Budget:** Building on the previous constraints, we have established the need and competencies of the resources that will be necessary to produce the deliverable. If exceptional quality for the project deliverables is required, using the standard model for budgeting may not be sufficient. For example, if it is standard practice for the performing organization to use top down methods in estimating, these methods may not be adequate. It may be necessary to use the Wideband Program Evaluation Review Technique (PERT) for greater accuracy. Because this project's expected quality exceeds normal quality, the Wideband PERT estimate will be a superior estimating tool. This constraint is only as good as the information and experience of the subject matter experts (SMEs) that are used to craft the estimates.
- **Resources:** As stated before, the competencies of the human resources and the abilities of the equipment necessary to deliver the expected quality of the deliverable must be defined. The ability to garner the required resources within the budgetary constraints is generally one of the two biggest challenges of the PM and other key stakeholders. It is at this point that there is usually a revisit to the level of quality that

was established and the scope of the project. There will probably be compromises at this point. If the previous constraints must be adjusted, don't forget to keep them balanced.

- **Risks:** Assessment of risk must be made based upon the intended enforcement of the previously decided and defined constraints. Risk is based upon assumptions that constraint limitations have been accurately assessed. Typically, the greatest risks are not outside the control of the PM. Experts estimate that 85% to 90% of risks to a project can be identified and managed prior to or during the execution of a project. The greater risks are from inadequate planning and optimistic estimates.
- **Schedule:** The second biggest challenge for the PM is controlling the resources and dealing with the human nature factor. Adherence to schedule is always complicated by the ability of resources to focus on the task at hand. A duration estimate of activities is a complicated formula based on the resources competencies, availability, focus, and most important, attitude. The ability to predict a resource's attitude and mental state in the future is nearly impossible.

## Conclusion

The journey to emphasize and illustrate the importance of identifying constraints in regard to project deliverables continues. The more effective and efficient the PM and key stakeholders are in balancing the identified constraints, the better the chances of a PM being able to deliver a successful project. Past constraint models have served our industry well. As we follow the path of progressive elaboration in the project management industry, we will discover or create more creative ways and tools to accomplish our goals.

It is my wish that using the SHCM<sup>®</sup> will help the students and practitioners of project management see the value of identifying all of the constraints and plan more effectively. It is my hope that the Project Management Institute will recognize the SHCM<sup>®</sup> model and the SHCM<sup>®</sup>-WBS as a valid concept and incorporate it into the *PMBOK<sup>®</sup> Guide 5<sup>th</sup> Edition*.

## About Forward Momentum, LLC

Forward Momentum, LLC is a woman-owned small business (EDWOSB/WOSB) and Project Management Institute® (PMI) Registered Education Provider (REP). Since 2000, Forward Momentum's real-world experiences, coupled with practical application of theory, have helped realize project management, leadership and learning potential within to commercial, government and non-profit organizations. As a boutique firm, we pride ourselves in understanding your business, analyzing your learning and development needs, and driving efficiencies and growth through consultative engagement.

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## About the Author

Darrell G. Stiffler, PMP is a professional with over 20 years of operations and information technology management experience in a variety of industries and areas including IT, insurance, health care, financial services, construction, retail, software development and maintenance, manufacturing, and transportation. He has consulted with both large and small organizations. He has a military background and currently applies his years of experience to train and consult others in project management and ITIL professional development. He received his PMP designation in September of 1999, a time when there were only 12,000 PMPs in the world. He is also certified in ITIL Foundations v2 and v3.