



Knowledge Area	Project Management Tools & Methodologies
Title:	Project Management “Hot Topic” – Can We Do it Any Faster?
Author:	Dr Trish Melton, MIME Solutions Ltd

Introduction to the knowledge

This paper introduces a project management “hot topic” – one that project managers are forever discussing: **can we deliver projects any faster?**

Main areas covered are:

- The strategies that project managers use to fast track project delivery;
 - How they achieve project speed & project success
 - The risks they introduce
 - The risks they mitigate
- Identification of the typical schedule development & delivery culture
- The Theory of Constraints (TOC) applied to project management
 - Introducing schedule buffers and contingency run-down
 - Proposing a new schedule development culture
- The application of TOC to an example project to demonstrate the benefits:
 - Identification of project bottlenecks
 - Understanding and responding to schedule risk
- Other cultural issues which support the application of TOC
 - Lean Six Sigma principles
 - Risk Assessment

Main body of knowledge

There are many reasons why there is a continuing focus on project speed but generically most projects need to be complete as soon as possible to start to realise the benefits from the investment in the project – whether this is capital or revenue investment.

Much has been done over the years to speed up projects but many of these have introduced further risks themselves. This is because they have not understood the true cause-effect relationships within schedule development and the culture which drives schedule development behaviours.

If we look at an example Pharmaceutical Facility project that was delivered 10 years ago (approx £15M, Greenfield) and then an equivalent one delivered 5 years ago we would see the following:

Schedule KPI	Project A 10 Years Ago	Project B 5 years ago	Project C Vision
Average Project cycle time (months)	24	18	15
Schedule Variance - late (months)	6	12	1
Schedule Variance - early (months)	6	3	1

Project A – describes a very traditional approach to the schedule development based on previous norms both in terms of activity duration and dependencies. Both include a high degree of “safety” to cover both real and perceived risks. Variation over a number of projects is normally distributed and project success is predictable to within 6 months.

Project B – describes a fast track approach where activity durations have been left as per the norms but the dependencies have been challenged and/or ignored. As a result



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increased risks are being taken and whilst overall project cycle time reduced there is an increased potential of a higher schedule variance (late). As a result overall predictability of project success decreases.

Project C – this is our vision for future projects. The decreased variation is our vision of predictability and the decreased cycle time is based on a different culture of schedule development and management of delivery.

If we root cause “why schedules are not met” then we come up with some interesting results – the majority having a link to both schedule development as well as schedule management during delivery:

- Unexpected things happen for which we have no contingent response
- Expected things happen for which we have no contingent response
- Schedule contingency is “lost” within each activity and then used inappropriately
- Activity duration estimation activities are flawed and/or based on inappropriate norms and integrate a “safety factor” within them
- Activities always start as late as possible so any integrated “safety” not required can’t be used
- Resources are often distracted by other work outside of the project – multitasking
- Any time “saved” by an activity cannot be used as resources are not available (focussed on “due dates”)

There seems to be a myth that the critical path of a project is “fixed” for a specific type of project and that to speed things up we have to introduce and then mitigate risks by ignoring dependencies, e.g. when we send out tenders for a package of equipment before the detailed design is complete we are risking potential “rework” if the design basis changes; the benefit of purchasing a long lead critical path item as early as possible appears to outweigh these risks.

This paper introduces three concepts which are changing the culture of schedule development & management:

- The Theory of Constraints (TOC)
- Lean Six Sigma
- Schedule Risk Assessment

The Theory of Constraints has been successfully applied to project management and is certainly one of the key concepts in changing schedule development culture.

- TOC focuses in on the bottlenecks within a process and then works to “exploit” it subordinating all other processes to it on the basis that you can never move any faster than the bottleneck (Any resource whose capacity is less than the demand placed upon it).
- It looks at dependent events and their statistical fluctuations.

When we develop a project schedule we define a list of activities (work breakdown structure), estimate their duration (thus introducing statistical variations) and then look for dependencies. In doing so we build a critical path where the bottleneck is often resources required to perform critical activities.

TOC proposes the development of a **critical chain** as opposed to a critical path. If resources are always available in unlimited quantities then the critical chain is the same as the critical path. It proposes that:

- The schedule is built initially without any “safety” – recognising that there may be only a 50% confidence of achieving these



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- Resources are “ring fenced” and categorised as those doing critical or non-critical tasks
- The schedule is NOT managed by “task due dates” but by “time to complete”
- Schedule “buffers” are built based on identification of likely task variation and placed within the schedule to protect critical activities from non-critical ones

In this way a project timeline can be significantly reduced:

Another complementary principle is “lean thinking” :

- Challenge the traditional work breakdown structure Vs the definition of customer value
- Eliminate all non value adding activities – these are waste
- Allow value (activities, information, decisions) to flow

The Pharma Industry has already undergone significant culture change with the advent of a “risk based approach” in all parts of the product lifecycle. Quality Risk Assessment (ICHQ9) is a “draft consensus guideline” providing guidance on the principles and some of the tools of quality risk management (QRM) that can enable more effective and consistent risk based decisions. It is a collation of best practice risk management tools, processes and techniques allowing the reader to assess which is most appropriate for their particular situation based around a general risk management process.

Risk assessment is therefore another part of the “new culture” for schedule development and management. Whereas previously all risks were treated similarly (in a risk adverse culture) or conversely ignored (in a risk taking culture); now risks are identified, assessed and an appropriate risk response defined based on risk impact. Schedule risk assessment is one specific tool used to allocate schedule risk on an activity-by-activity basis based on potential impact of not meeting the schedule. It also proposes the collation of “schedule risk” into buffers which can be “run down” as the project progresses. It is analogous to a cost contingency run-down methodology.

These three concepts lead to a schedule development and delivery culture which can reduce overall project cycle times predictably. So we can “**do it faster**” if we’re willing to invest the time and energy into a culture change where:

- We increase the quality of our schedule estimation
- We consider resources and resource dependency
- We collate all schedule risk into various schedule buffers and place them where they are most likely to protect the value delivery to customer
- We evaluate whether activities are value adding and remove those that are waste
- We manage critical dependencies and minimise “management by milestone”

This level of change is not easy and it has taken time for some of these concepts to be tested, however benefits claimed by these concepts are noted:

- The TOC methodology (critical chain) reports a 95% on-time and on-budget completion Vs benchmark data for comparable projects which are generally delivered late
- The application of lean six sigma has decreased project cycle times and overall project costs of the order of 15% in early projects with the potential for further decreases
- The use of “best practice” risk management techniques has enabled both of the above to be effectively applied
- The business, the customer, has an increased assurance that the project will be delivered when stated



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**Knowledge
Summary
and
Conclusions**

There are three concepts which are working together to reduce project cycle times:

- Theory of Constraints
- Lean Thinking
- Schedule Risk Assessment

Together they require a change to the culture of schedule development and management during delivery.

References

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**Contact
information**

Trish.Melton@mimesolutions.com