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Project Sequelae
by Dr. Deepa Bhide
Featured Paper

Project Sequelae [1]

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Abstract

Sequelae is an important concept in the medical world closely aligned to the therapeutic management of patients, be it surgical or medical. Sequelae, when they happen, add to the burden of disease. By drawing parallels between healthcare and project management domains on the management of sequelae, the author believes that sequelae go beyond the understanding of risk management. A good understanding of the spectrum of possible sequelae (short-term or delayed) will add to the identification of the complete scope of the project. While the negative sequelae warrant treatment and prevention strategies, positive sequelae merit exploitation for the benefit of the project team and organization. This will not only have financial rewards for the team but will also protect/enhance the project manager and his team's credibility. On the lines of 'Disability Adjusted Life Years (DALYs) to measure the 'Burden of disease' from the medical world, the author would like to conclude with a call for exploring ideas to measure the ultimate value of the project which includes the occurrence of positive or negative sequelae.

Introduction

"Expect the best, plan for the worst, and prepare to be surprised." – Denis Waitley

Project Management (PM) tenets such as transparency, adaptation and resilience, risk management, authority, and alignment with organizational goals are invaluable in making the project successful. Projects get recognition for the value they add to the sponsors and community. Any negative after-effects of project execution can break the credibility of the project manager and project management fabric.

In the medical world, 'sequelae' is an important concept in patient care management. Through this article, the author intends to explore synergy or lack thereof of sequelae with project management. The author would like to draw attention to exploring this concept to understand and measure the ultimate value of the project.

According to Merriam-Webster dictionary[1] the term "sequela" means i) an aftereffect of a disease, condition, or injury or ii) a secondary result. To understand sequela (plural: sequelae), let's take a few examples from the medical world.

- A 46-year-old male[2] was brought to a neurology clinic for evaluation of epilepsy. Two years ago, he had been involved in a motor vehicle accident and had sustained a traumatic brain injury (a complicated injury involving vital organs such as the brain) and bleeding in the brain which was confirmed by a CT scan. The

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neurological assessment confirmed epilepsy as a sequela of traumatic brain injury that he had sustained earlier.

- Post Covid-19 infection sequelae are being reported as a common occurrence across the globe. Three years after the pandemic, reports are trickling in around a diverse set of symptoms noted by patients up to 110 days after the initial illness. According to this study published in the JAMA Network Open[3] by Jennifer K. Logue et all, the most common persistent symptoms of post-Covid-19 sequelae were fatigue, loss of sense of smell or taste, and brain fog.

A few more examples of sequelae in the medical world can are as follows

Reason (Initial Condition)	Result/Residual	Comment
Colle's Fracture (Fracture of the wrist joint)	Arthritis of the wrist joint	Sequela
3rd Degree Burns	Contractures of skin	Sequela

In these examples, the sequelae are different diagnoses (a separate code assigned by ICD-10 diagnosis classification of medical conditions[4] and needs the letter "S" at the 7th place in the coding format) from the original condition and are *not* an exacerbation, worsening, or complications of the original condition. Sequelae are new/de novo conditions (diseases) that have arisen as consequences of the original condition.

Attributes of Sequelae

Important: A clear link can be established between the primary condition and the sequelae.

A few attributes[4] of sequelae are as follows. Sequelae are:

- **Not complications** – this is an important point to distinguish the two. By definition, a complication is a negative problem or event that follows an illness or a therapeutic modality (e.g., procedure or treatment with medications). It often complicates the delivery of medical care. Cause and effect relationships though may be present may not be assumed. A few examples of complications in the medical world are as follows.

Reason	Result		Comment
Skin grafting	Infection of the graft		Complication
Insertion of urinary catheter	Urinary Tract Infection		Complication
Insulin Pump Malfunction	Diabetic Ketoacidosis		Complication

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- Not limited by time – after-effects can occur at any time and are not limited by duration.

- In most cases, chronic in nature as their impact is felt over a long period of time (vs acute or short-lived).

- In most cases, seen after the primary injury/disease/illness has ceased to exist. E.g., active Covid-19 infection has ceased and the sequelae are seen after a gap of time. Complications occur when the illness is still active.

Other than the medical management of the new condition (the sequelae), sequelae merit legal consideration[5,11] in compensation and liability management. It's important to recognize sequelae as an extended liability. In the case of workers' compensation, sequelae are subsequent injuries/diseases related in some way to the primary injury during work. Examples of such compensable subsequent injuries could be infections due to therapies, and injuries due to falls caused by balance issues that are a result of the primary injury.

Sequelae are not always negative. As is evidenced by the article "Positive and negative psychosocial sequelae of bone marrow transplantation: implications for quality-of-life assessment" by K Fromm et al[6], who concluded that life-threatening diseases can trigger positive sequelae that can improve quality of life.

Sequelae relationship with Risk

The author would like to draw the attention of the readers to an article on risk management by Kim, Seong Dae presented in a PMI conference paper [7]. The author would like to build on the concept of risk management to explain sequelae in project management.

Originally derived from the idea of knowns and unknows created in 1955 by two American psychologists, Joseph Luft and Harrington Ingham in creating the "Johari Window", a technique for self-awareness and perception towards others, the concept of knowns and unknowns was popularized by Donald Rumsfeld (American politician, government official, and businessman who served as Secretary of Defense from 1975 to 1977 under president Gerald Ford) in 2002. In the author's opinion, the concept of sequelae extends beyond the concept of risk management. The author would like to use the concept to demonstrate the existence of sequelae as they relate to the three non-shaded quadrants.
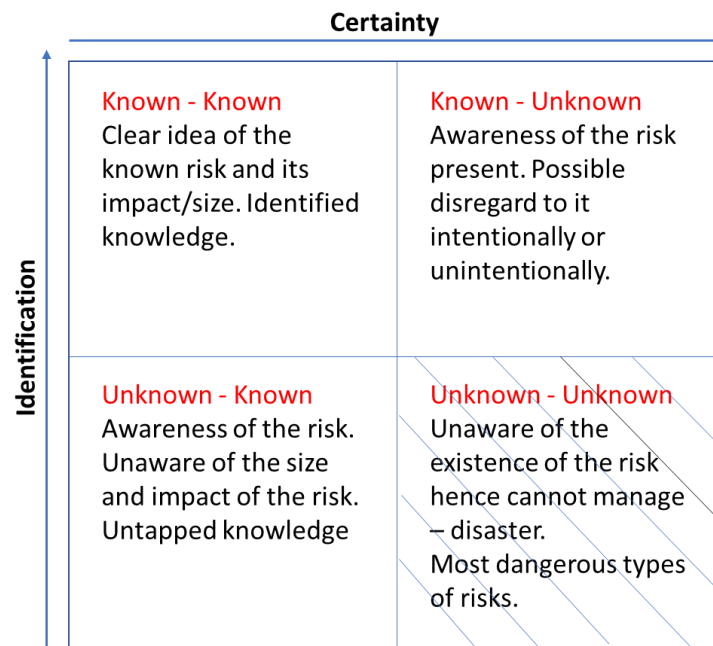
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Certainty

Known - Known Clear idea of the known risk and its impact/size. Identified knowledge.	**Known - Unknown** Awareness of the risk present. Possible disregard to it intentionally or unintentionally.
Unknown - Known Awareness of the risk. Unaware of the size and impact of the risk. Untapped knowledge	**Unknown - Unknown** Unaware of the existence of the risk hence cannot manage – disaster. Most dangerous types of risks.

Identification

Fig 1: Types of risks. In the author's opinion, sequelae, as a concept, fall in the non-shaded quadrants of the grid.

Sequelae in Project Management

Let's look at a few examples of sequelae from the project management world

• A recent incident[8] from the Indian metro merits mention here. XYZ* twin towers in India were demolished last month using 4000 kg of explosives ending a decade-long battle between ABC* firm and residents of the XYZ towers. As per this report, the battle was initiated when ABC firm, apparently changed their plans around i) the number of towers and ii) the height of three new towers. This meant the non-availability of promised amenities for the existing residents.

Fig 2: Demolition of the new towers (source: https://www.livemint.com/news/india/story-of-noida-twin-towers-what-led-to-demolition-of-supertech-building-11661591676634.html)

This irked the residents who were unaware of the proposed changes and construed this as a breach of contract. They appealed to the regional authority and then to District and state high courts to stall the project to pass a directive to demolish these illegal towers. The demolition of the towers with the accompanying loss of credibility of ABC firm as well as inconvenience to human life can be viewed as sequelae of the XYZ project. A direct

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cause-and-effect relationship can be established that led to the sequelae and their management.

From a risk management standpoint, the risk category could have been in any of the 3 non-shaded quadrants of figure 1 as above. What could/should have been done differently here by both the teams (residents and ABC firm) at the initiation of the project or as the project was underway? How could these sequelae have been avoided?

A simplified representation of this concept could be as follows
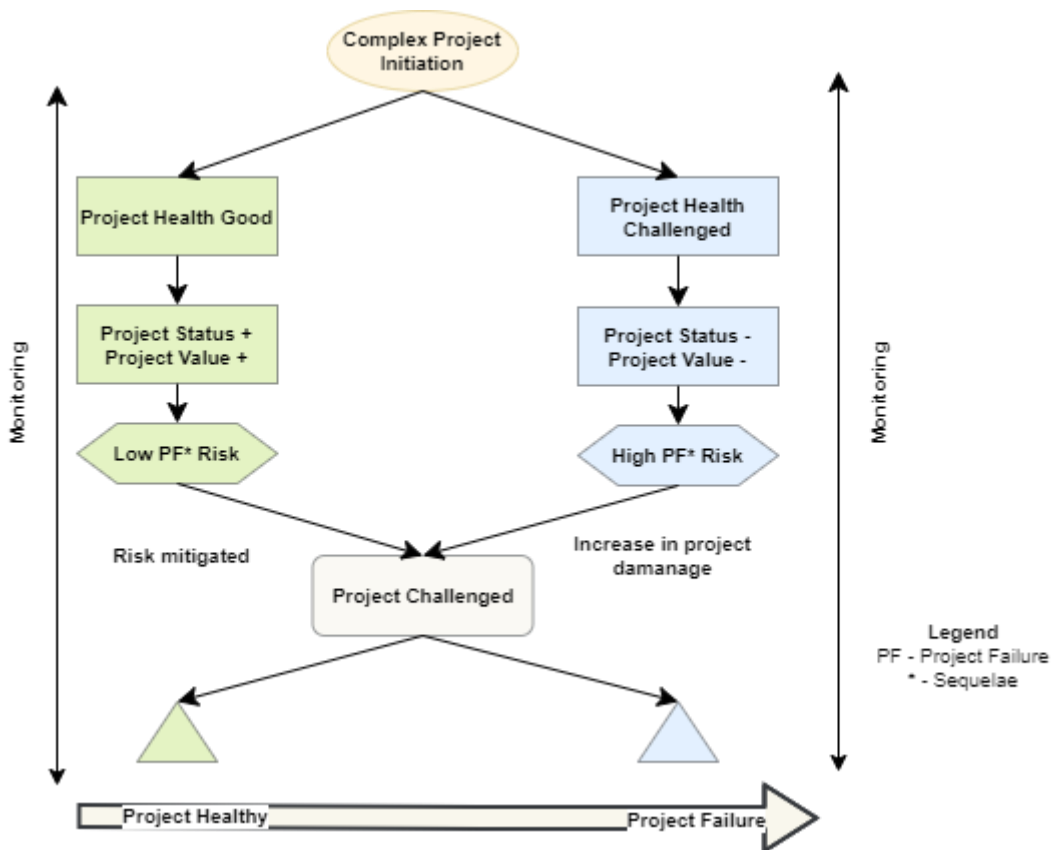
Fig 3: A schematic representation of the development of project sequelae in case of complex projects.

- Organizations are looking into new ways to integrate technology into their DNA to enhance efficiency. Ms. A* enterprise developed a new IT application to enhance its training program. The IT application enabled virtual guided training with intelligent filters for tracking the performance of the candidates. The AI-enabled tutor trained the students on business-related concepts. Ms. A took pride in its new application that integrated learning across the geographies and strata of employees. While the IT application was a commitment for a huge investment from Ms. A group, the after-effect was its reduced need for full-time employees to man the training program. Ms. A group, over the next few years, made steady progress in making its training program efficient and profitable.

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The above example is an example of positive sequelae that resulted due to the training application deployment by Ms. A group.

Note: names have been changed to maintain confidentiality.

Discussion

Are sequelae a reality in the project management world? Do all projects start with an assumption of the possibility of sequelae (positive or negative)? How does the team document these? For many projects, the possible relationship of the project initiation with long-term sequelae (if they occur) may not be established. This is similar to the fact that it is difficult to attribute the delayed sequelae (or at times complications of sequelae) to many infectious diseases. Criteria have to be specified to decide when the strength of evidence is sufficient for attributing project failure associated with those sequelae to their root cause.

"Burden" of the project: Just as the medical world has "burden of disease" as a concept that encompasses not only the disease but also its complications and sequelae, the burden of sequelae or differently put, the total scope of the project (including possible sequelae), in the project management framework is an important concept to consider.

'Burden of disease', in the medical world, is equal to the sum of mortality and morbidity and can be measured by a metric called 'Disability Adjusted Life Years (DALYs)[9]. One DALY represents losing one year of healthy life (premature death or disability). The assumption here is around the occurrence of only negative sequelae. The author would like to explore ideas to measure the project's ultimate value, including the occurrence of positive or negative sequelae.
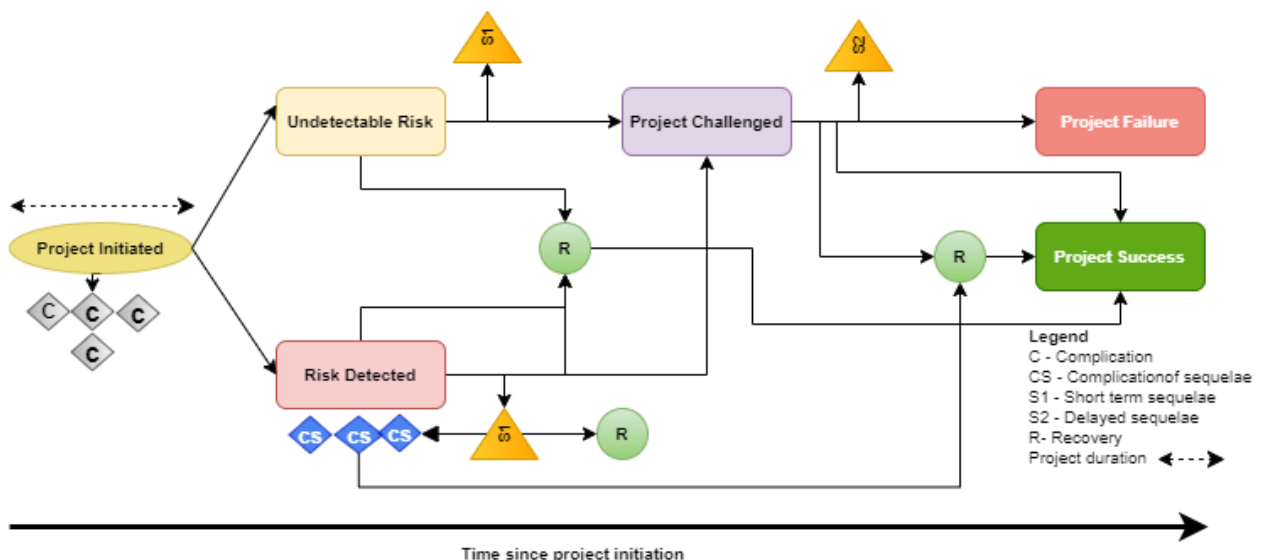

Fig 4: Outcome tree linking project initiation through project progress or failure[10]. Note the development of sequelae at varying stages (early and delayed). Also, note C5, and C6 are complications of the sequelae that further add to the scope of the project. R denotes project recovery leading to project success.

Can all sequelae be prevented? Probably not. But monitoring the project regularly can help discover the size and impact of the sequelae and flag the project manager for taking an action

Are there systems in place to monitor the development of sequelae? As in the medical world where there is a regular follow-up of the patient to check on the development of sequelae if any, a regular follow-up of the completed project could avoid potential issues with sequelae. It's vital to maintain a log/registry of these sequelae (similar to the risk register) to plan preventive measures if possible. Processes need to be developed to track and exploit positive sequelae.

How can we treat the sequelae? Sequelae, though have a cause-and-effect relationship with the original condition, are different from it. They call for a de novo diagnostic evaluation and treatment and may not be a part of the original illness or procedure.

In the author's opinion, Agile project management, with its nimble processes, in some form is a plausible methodology to avert the development of sequelae. Yet the Agile framework has an opportunity to develop a comprehensive process to avoid the development of sequelae and also its management.

Approach to Sequelae

Project managers and more specifically risk managers can note some of these lessons from the healthcare domain to prevent, assess and treat negative project sequelae.

1. **Project complexity and the possibility of sequelae:** following a disease or illness, the healthcare team has a high index of suspicion for the possibility of sequelae. Having an iota of suspicion is critical to plan and educating the relevant stakeholders. A consultative approach based on the complexity of the project along with an active reference to the lessons learned repository is required to discuss the possibilities of project sequelae.

2. **Monitoring the development of sequelae:** Project monitoring is key to identifying and tackling sequelae development at an early stage. As the adage goes, "a stitch in time saves nine", a regular follow-up at planned intervals is necessary to check on the development of sequelae if any. This includes any blind spots as well as the duration of project tracking beyond a stipulated period of tracking.

3. **Awareness and education of the related stakeholders:** stakeholders are often not competent enough to understand the technical nuances of the disease. It's important to simplify the message and educate stakeholders so they are engaged with the project team in the process of sequelae management. In the healthcare world, as a pediatrician taking care of an infant with brain injury at birth, I often plan an education session with parents so they are engaged and help me with identifying abnormal patterns in the child if any, and also the treatment. Along the

same lines, having open, timely, and two-way communication between the project team and stakeholders is key to the early identification of the sequelae.

4. **Diagnosis and treatment of sequelae**: It goes without explanation that a proper diagnosis and treatment of the sequelae is critical for restoring quality of life and assessing the burden of disease. A project manager can institute measures not only to prevent a negative impact of any sequelae but also to take appropriate steps to ensure treating them. It's also important to avoid any complications ensuing from the sequelae or treatment of the sequelae.

5. **Document lessons learned**: Maintaining a log (government registries or done through individual healthcare systems) of such sequelae can help in statistical analysis and research for prevention. The transition from lessons learned to lessons applied is equally critical.

Conclusion

In their day-to-day practice, physicians/surgeons and healthcare workers deal with the possibilities of sequelae fairly frequently and hence sequelae pose challenges to the credibility of the healthcare team. It's especially so while dealing with a complex case.

Sequelae are a possibility in the project management world, especially in the case of complex projects. Building on risk management, sequelae management can be thought of as a core element of a project's strategic planning. By drawing the appropriate cause-and-effect relationship between project initiation and resultant sequelae, the broad scope of a complex project needs to take care of potential short-term and delayed sequelae.

On the lines of 'Disability Adjusted Life Years (DALYs) to measure the 'Burden of disease', the author would like to conclude with a call for exploring ideas to measure the project's ultimate value, which includes the occurrence of positive or negative sequelae.

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About the Author

Dr. Deepa Bhide

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Dr. Deepa Bhide, MBBS, DCH, PMP has over 20 years of professional experience where she has blended medical practice and research with IT and Project Management. She juggles consulting, training, and operations, and is proficient in clinical medicine, project management, and healthcare information technology. Starting her career as a medical practitioner, she has worked with varied organizations before her current stint as a vice president – Research, with Cotiviti.

Her passion for IT and Project Management was born out of the day-to-day interaction that she had with her patients. Needless to say, Deepa's growing interest and work in these areas helped her view Project Management as a backbone of progressive healthcare. Her paper on "Patient Care - A Project Management Perspective" is a widely acclaimed one having received global recognition and acclaim. Deepa is an active contributor to PMI with her articles on a cross-domain confluence of Healthcare and Project Management. With a physician background as a solid foundation to leverage IT/PM skills and knowledge, Deepa has blended her broad-based experience and learnings to present a unified, holistic wholesome view of Project Management and Healthcare. Through various webinars, events, talks, and writings across platforms, Deepa has been an evangelist in championing global project management during the Covid-19 pandemic.

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A Gold medalist from Osmania University for standing First in the MBBS course and also for Human Physiology, she went ahead to pursue her DCH in Pediatrics and Child health. Deepa is an active member of the PMI Pearl City Chapter with their volunteer initiatives. Deepa has served a variety of roles in local and global PMI regions. In the role of Council Lead for PMI's Healthcare Community of Practice for a period of 2 years (2013-15) and was involved in identifying, and mentoring volunteers, collaborating across geographies for knowledge assets. Deepa currently is a part of PMI's Ethics Insight Team, a global team of 8 volunteers for advocacy of PMI's Code of Ethics and Professional Conduct.

Deepa lives in Hyderabad, India, and loves to travel, sing and experiment with global cuisine. She can be contacted at deepabhide@gmail.com