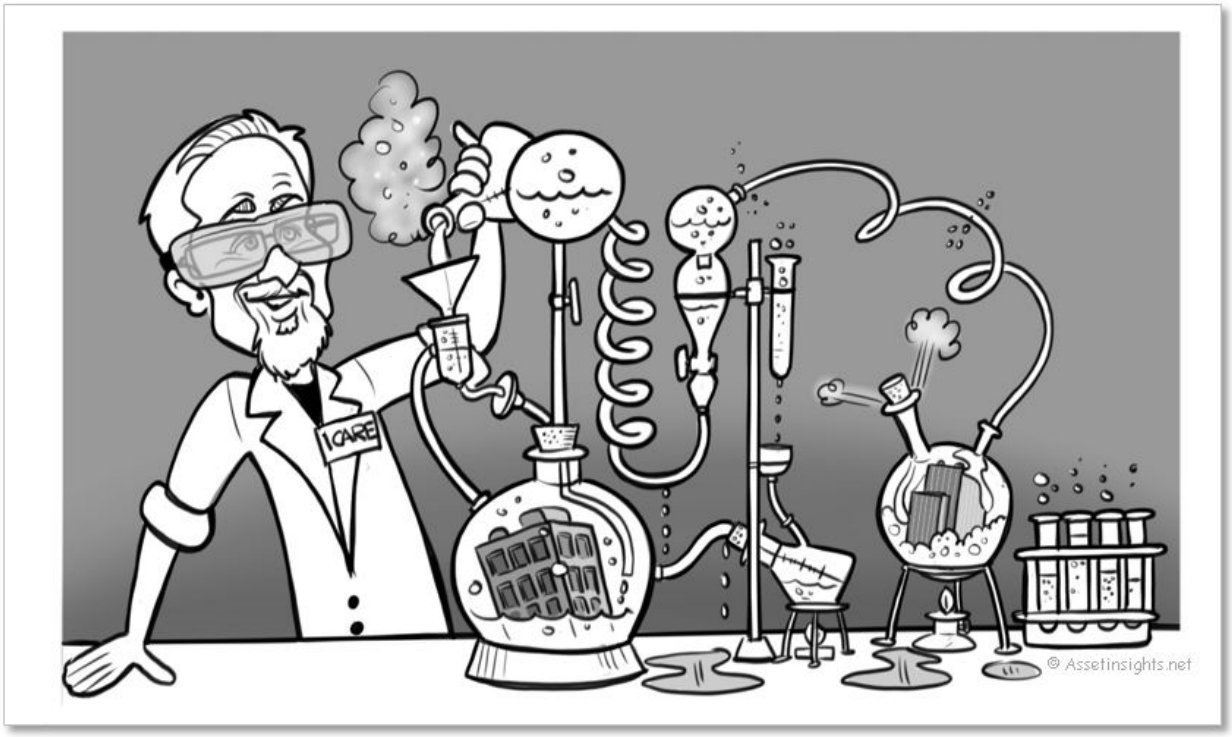
Asset Needs Assessment: A Bird's Eye View

David Albrice, June 21, 2015



"Eureka! - I have found it!" -- Archimedes.

Have you heard the one about the thirsty crow who came upon a pitcher with some water at the bottom? The water was beyond the reach of its short beak and the crow feared pushing over the pitcher less all the water should spill out.

The bird was resourceful and looked about for a solution.

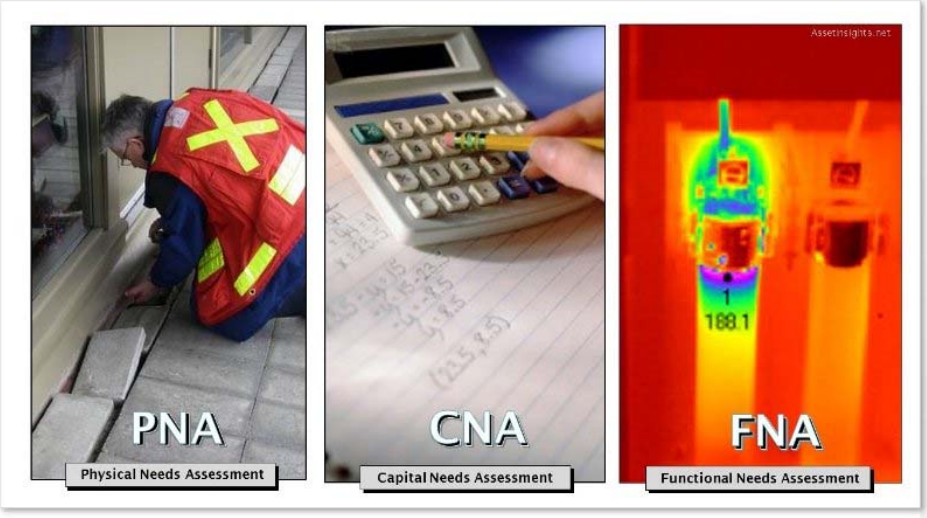
"Eureka, I have found it!" exclaimed the Crow; and it proceeded to drop pebbles into the pitcher, one-by-one, until the water rose high enough in the pitcher for it to drink.

The Crow had now quenched its thirst and was able to continue on its way.

Just like the Crow, asset managers need to periodically quench their thirst for knowledge about their assets -- efficiently without blowing their tight budgets.

In the world of asset management, there are many "pebbles" laying around which come in a variety of shapes and colours. Depending on their size, and how they are grouped together, they can displace more or less water. These pebbles are necessary tools to help assess the performance of assets and to identify the needs for responsible stewardship. They can be grouped into three categories:

- Physical Needs Assessments (PNA)
- Capital Needs Assessments (CNA)
- Functional Needs Assessments (FNA)



Let's take a look at how they each of these pebbles can be grouped to displace water in an asset management pitcher and bring us closer to hydrating ourselves on the deeper insight buried in our assets.

1. Physical Needs Assessment (PNA)

Pebble shape -- A PNA indicates the current state of physical degradation of an asset, typically quantified as the backlog of deferred maintenance and/or outstanding repairs, which is then prioritized based on asset criticality.

An example: a PNA identifies that a buried storm water pipe (linear asset) is plugged with sediment and needs to be power-augered and hydro-flushed to ensure proper storm runoff.

Pebble colour -- There are many types of PNAs such as code reviews, technical audits, warranty reviews, and maintenance reviews. PNAs look backwards in time to understand how the asset arrived at its current physical condition.

Water displacement -- A PNA raises awareness of the condition of the asset by providing the asset manager with insight on the "catch-up" costs - in other words, what remediation is needed to fix something.

While an understanding of physical needs can provide some guidance, it does not suffice to help the asset manager with all needs, particularly as an asset gets older.

A PNA is usually the first pebble to go into the pitcher followed by....

2. Capital Needs Assessment (CNA)

Pebble shape -- A CNA is a financial planning tool that provides a realistic and defensible forecast of the remaining useful life and normal lifecycle replacement of the major components of an asset.

An example: a CNA forecasts that the roof on a building (vertical asset) has 15-years of remaining useful service life, at which time it will cost $280,000 to replace (based on current market pricing and 2% inflation compounded annually).

Pebble colour -- The different types of CNAs include: capital plans, depreciation reports, and reserve studies. But regardless of what they are called, they are all about looking forward in time.

Water displacement -- A CNA raises awareness by giving the asset manager insight into the "keep-up" costs - that is, what will be required over the desired planning horizon. A CNA may sometimes require an earlier PNA to help provide a strong empirical foundation for the forecasts.

A combination of PNA and CNA provides tremendous insight and will hydrate the asset manager for many years, particularly during the earlier stages in the life of an asset.

However, sometimes another pebble is needed...

3. Functional Needs Assessment (FNA)

Pebble shape -- An FNA is used to identify the opportunities for adaptation and/or upgrades of an asset to address different forms of obsolescence, such as:

- Legal obsolescence (changing codes and standards)
- Economic obsolescence (energy efficiency measures)
- Technological obsolescence (new products on the market)
- Style obsolescence (evolving aesthetic tastes)

- Functional obsolescence (changing space user needs)

An example: a FNA determines the financial payback on replacing a low-efficiency boiler with a high-efficiency boiler even though the existing boiler has 10 years of remaining useful life

Pebble colour -- FNAs are highly varied and include: seismic reviews, hazardous materials studies, energy audits, and barrier free access. Regardless of what they are called, they are all about looking laterally rather than just forwards and/or backwards.

Water displacement -- An FNA raises awareness by providing the asset manager with insight into the potential "get-ahead" costs - that is, opportunities to adapt, to modernize, and/or to upgrade.

Where the PNA and CNA are focused on physical degradation, or wearing of assets, and fall within the domain knowledge of engineering disciplines, the FNA is geared more towards the fading of assets. Depending on the type of fading, the FNA may require the additional expertise of professionals such as architects and urban planners.

An FNA is usually dropped into the pitcher after the other two pebbles have already been submerged. And this usually occurs after an asset has reached a certain age. It is rare for an FNA to be the first pebble cast.

***

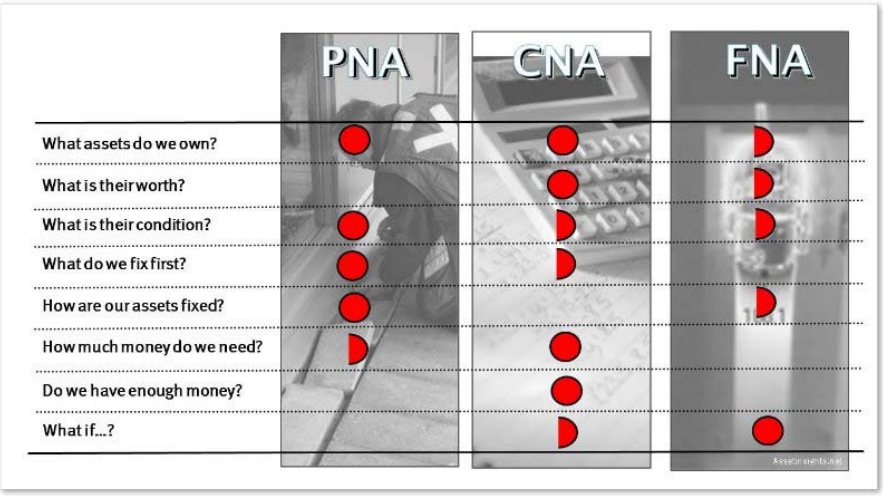
And now.... the Archimedes' Principle

This is where it starts to get complicated. It is not just a matter of three types of assessments, but also the need to match these assessments to the right assets, for the right reasons, at the right time, for the right cost and... to repeat this on the right cycle.

What needs to be considered when determining how to use the three pebbles?

1. Assessment Value

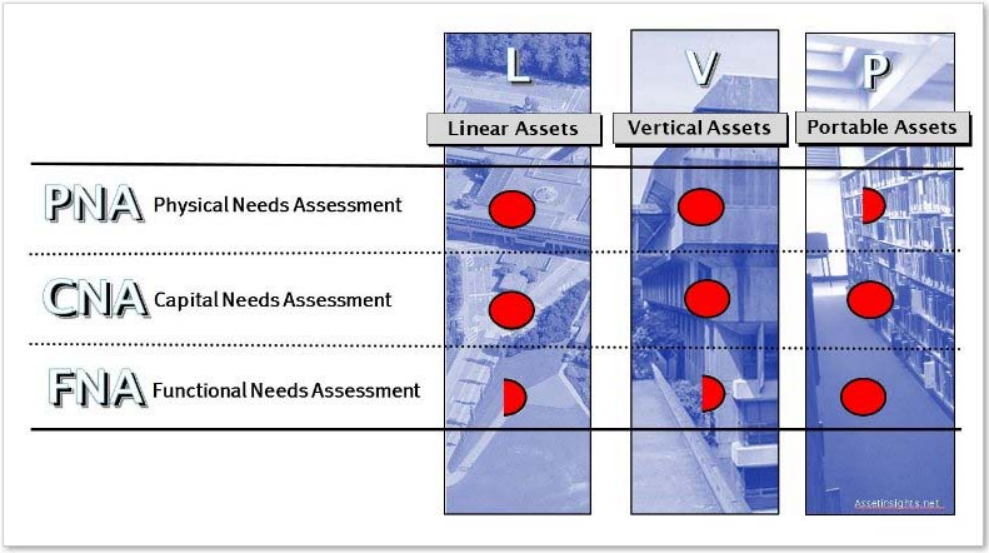
To start, the asset manager needs to know what kinds of data will be returned by each type of assessment when applied at the right level of detail. The figure below illustrates the different types of information that are returned for each of the three classes of assessment.



Clearly, no one assessment can answer all the questions that arise over the life of an asset.

2. Assessment Match

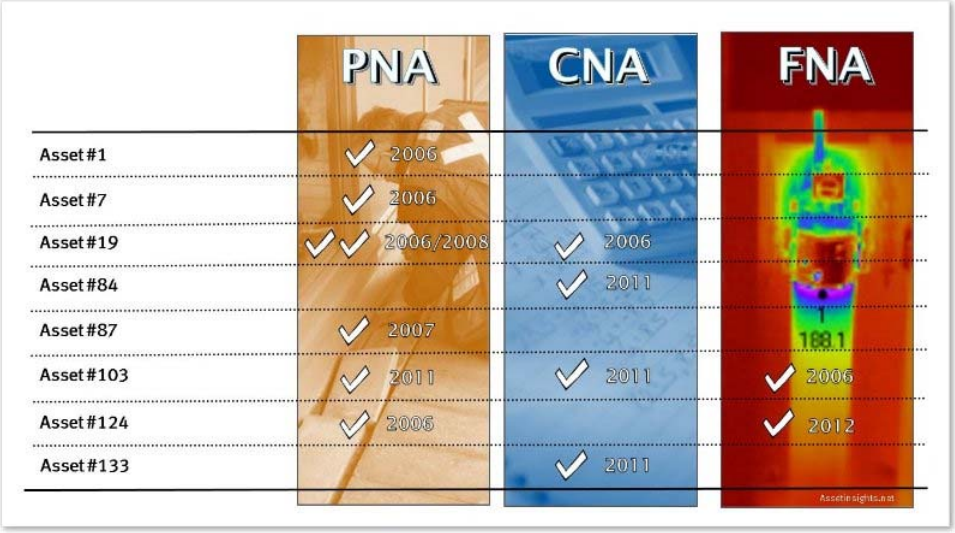
Second, the manager needs to align the assessments to the different types of assets - linear assets (infrastructure), vertical assets (buildings) or portable assets (such as plant machinery and IT). An earlier post identified the different classes of assets.



The assessment match will vary not only by asset but also at different stages in the life of each asset. For example, is it not necessary to commission an FNA on a young asset.

3. Assessment Mix

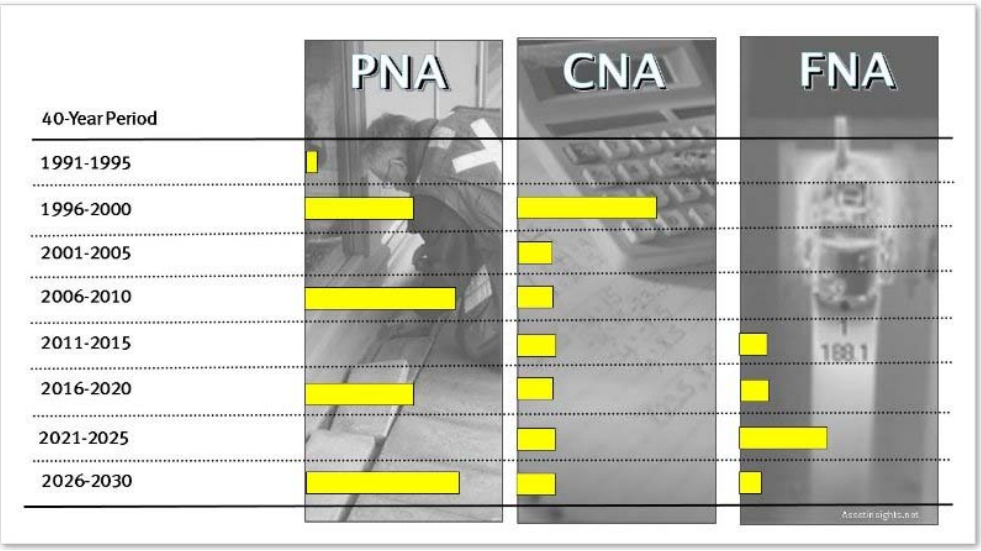
Third, the manager needs to track the overall suite of assessments that have been aligned across the asset register and the status of the completed assessments.



It can be a challenge to ensure the continuity of corporate memory over the long life of certain assets, particularly since asset management teams will change. Hence the importance of keeping a record of all the pebbles that have been placed in the pitcher.

4. Assessment Cycle

Finally, the asset manager needs to know when a study becomes stale dated and needs to be re-commissioned. The figure below illustrates the cycle of studies completed over the many decades of the life of an asset.



And back to the Crow...

The Crow demonstrated resourcefulness when placing small stones into the pitcher and it was the cumulative effect of this incremental approach that enabled it to achieve its goal of getting to the water in the pitcher. Similarly, asset managers can increase their effectiveness by knowing how to leverage the different shapes, colours and sizes of the asset assessment pebbles to displace the appropriate amount of water.

Question: How do you know when to add another pebble into your asset management pitcher?

****

This blog is loosely based on the Aesop's Fable the Crow and the Pitcher.

David Albrice is a Senior Asset Management Specialist at RDH Building Engineering Ltd. His experience thinking about pebbles and water comes from his long trail runs and work with different asset management teams. David can be followed on Twitter and other articles can be read on LinkedIn Pulse.