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[A Pecha-Kucha Presentation](#)

[Evolving a Software Cosmos](#)

This presentation is part thought exercise or [Kōan](#)

A Metaphor!

Imagine a software project is a cosmos

We can alter its evolution, the forces within it and the balances at play

We are part of it, yet also above it

A Software Cosmos

In our cosmos everything is interconnected and interrelated

None of us are casual observers, whether we act or don't things happen and equilibrium and balance occur

If we want to evolve it we need to feel it, understand it

Structure of the Cosmos

Our cosmos has deep and hidden structure, like a scientist we need to continuously question, learn and discover

The hidden structure forms surface structures - Illusions and hints of the underlying nature

As you peel the surfaces deeper insights are revealed, yet all you see more surface structure!

Structure by Example

Galileo drops objects from the tower of Pisa; he discovers gravity gives constant acceleration

Newton peels gravity back further, he sees movement of planets and how mass and gravity relate

Einstein peels it further; but reveals still more surface structure - Peel...

Visualizing Structure “The Globe of Knowledge”

Imagine structure as a darkened globe, at the centre is the unknown, deep structure, casting shadows onto the globe's surface

We scrape holes and peer at the shadows, attempting to see and learn more

In our cosmos, what lies at the centre? Practices, processes, values, beliefs and the software artefacts?

Evolving a Software Cosmos

Depending on your choice of scale - We are gods of our cosmos but we can never fully document, describe or understand it

We also need to be mindful and grow an understanding of how things are connected and balance

Scale and Context

We need to recognise the importance of scale and context

We may be too close to see or comprehend everything; if we could stand back further we might see missed patterns in the surface structure.

Do we have all the insights available to us – Is someone or something missing?

Principles

We need principles to grow our cosmos

Principles represent externalized and agreed understanding of the deeper structure

They reveal consistent surface structure

They remove individual filters and allow us to share a common perspective and a platform to work from

Balancing the Software Cosmos

Our Cosmos will reach equilibriums are they the ones we want?

What should we balance?

To get the right balance we need to know our desired outcomes

We also need to know if we have achieved them

A Pause for reflection

There is no one true way to grow a cosmos

LEAN/Agile principles and balances/focus arose from certain contexts; ours are not necessarily the same

Like Galileo, Newton etc. We need to peel back the layers of our cosmos to do this we borrow from science and use the "scientific method"

Scientific Methods

A scientific method consists of the collection of [data](#) through [observation](#) and [experimentation](#), and the formulation and testing of [hypotheses](#)

I will cover a variant: [Plan Do Check Act](#)

Plan (Hypothesis)

Define the question and form your hypothesis

Examine the surface structures and collect data

Analyse for root causes

Develop an action plan

Do (Experiment)

Test your hypothesis/plan through experimentation and implementation

We need the ability to experiment (this echoes of slack?), to take an idea and run with it in a safe “controlled” environment

Check/Study (Analyse)

Measure changes and compare results against expectations

Examine the outcome of the experiments

Importantly - Check them against your hypothesis/plan

Why are things not as expected?

Act/Adjust (Communicate)

Based on your analysis - Determine what to change and apply the changes

Publish knowledge

Reflect

Continuous Improvement and Learning

PDCA is about iteratively improving; you run further PDCA cycles until no more improvement is made then lift the level or scope

We can run multiple PDCA's focussed on different hypothesis

Sometimes changes don't improve the system, this is fine, the key point is you learn and adjust future cycles accordingly

LEAN and PDCA

LEAN gives us principles (it also gives beliefs, but that's another presentation) – It's a ready made cosmos starter kit!

It also comes with suggestions on how we should balance our cosmos. E.g. focuses on process not people, on flow, value and purpose

Our hypothesis should center on how we can improve the balance in these areas – Across the enterprise

The Key to Evolving our Software Cosmos

In summary

The key to developing a software cosmos is developing a hypothesis.

This is not complex; it simply requires a clear statement of what result we expect from a specific action

Without a hypothesis, however simple, of what we expect before we act we cannot learn – We simply inspect and adapt

How to Start

Read over some of the “Try This” sections in the Lean Software Development [book](#)

Apply PDCA to some of the areas e.g. waste or value stream maps

We hypothesize that removing “x” will deliver “y”!

And that’s it! Just keep going!

20 – Rap-Up :-)

To be a responsible god of a software cosmos...

“Don’t make change through inspect and adapt
Be wise
Plan, Do, Check and Act!”