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|  | Enterprise Cloud Problem Statement  Why does the Enterprise Need A New kind of Control Plane For the Cloud  November 2019  Version 0.1 (Draft) |

# Problem Statement: The Paradox of Software Automation in the Enterprise

## Software Automation is at the Heart of what it means to become Digital

The Paradox of Automation in the Enterprise is at the heart of what it means for an enterprise to become digital. To begin the process of fully appreciating this we first need to look at the three observable [scientific laws](https://en.wikipedia.org/wiki/Scientific_law) in the field of Computer Operations:

1. Hardware will fail
2. Software will have bugs, and
3. People will perform routine tasks
   1. Inconsistently and
   2. Are subject to the laws of [diminishing returns](https://en.wikipedia.org/wiki/Diminishing_returns)

Law 3 – is by far the most impactful with regards to the Quality, Scalability, Resilience & Cost Curve.

Software Automation, however, solves for the third law by removing the need for people to perform “routine operational tasks”.

This is achieved by codify capability (defined as: *an instance of a routine operational task or set of tasks*). Once capability has been codified, it can be:

1. Copied at zero marginal cost (copying text files\binaries)
2. Distributed across the internet at zero marginal cost (leveraging monthly wifi\internet\data charges)
3. Executed at a cost that is trending towards zero marginal cost (locally compute\memory cycles)

Codified capability has the property of being almost free to copy & replicate. With the increasing proliferation of computing medium – Codified capability can increasingly be distributed to computing end points, for free.

The Codification of Capability, distribution via the internet, and the globally expanding computing coverage underwrites the [key economic change](https://stratechery.com/concept/aggregation-theory/distribution-and-transaction-costs/) – commonly referred to as digital – that effectively eliminates marginal distribution and transaction costs. This creates new rules of engagement whereby [software is eating away](https://a16z.com/2011/08/20/why-software-is-eating-the-world/) the competitive value proposition of traditional businesses.

Software is increasingly being recognized as both the key to new economic opportunities and an existential threat to incumbent [economic moats](https://www.investopedia.com/ask/answers/05/economicmoat.asp).

## Software Automation Creates a Paradox for the Enterprise

Software Automation gives us a “very long [lever](https://en.wikipedia.org/wiki/Lever)” that that dramatically amplifies the input\output ratio involved in computer operations. We can now achieve an order of magnitude more work, consistently and at a sub linear cost curve. An inherent [paradox](https://www.zdnet.com/article/beware-the-automation-paradox/) lurks within Software Automation that must to be addressed. To understand this paradox more fully, we need to consider the other two laws of operations.

Cloud (largely) solves for the first law “hardware will fail” by creating a software abstraction between the consumer of computing services and the provider - where the computing abstraction becomes a “Globally distributed [Warehouse Scale Computer](https://ai.google/research/pubs/pub35290)” that is presented over the internet as an API.  The problem of hardware failure now become largely abstracted away from the consumer\enterprise

Consumers of computing now never need to worry about hardware and its lifecycle (apart from edge computing and legacy app architecture dependencies).

This leaves the second law - “Software will have bugs”

These bugs can be either unintentional or malicious in nature. So, they can be further classified as bugs or breaches. This fact is at the heart of the paradox of automation:

*Through the application of automation, the implications of these bugs\breaches can have impacts that were previously impossible to achieve*

The precision, scale and speed of automation can wreak havoc or create harmony. It is amoral in nature so how do we ensure that we create the conditions for harmony and avoid havoc?

## The downside of this Paradox is highly seductive

Software is “behavior” (ware) that is easy to change (soft). As opposed to hardware, software has a seductive property in that by changing it, it creates a sense of agency and autonomy that equate to power. This feeling encourages more change and more often.

Hardware on the other hand creates a sense of fear when faced with the prospect of attempting to change the behavior - due to the rival nature of hardware it makes change very risky.

Software creates the feeling of being powerful. Through its inherent property of reversibility - it creates a sense of there being a lower risk of change.

Wielding this type of power at scale within an enterprise context where regulation and corporate governance demands risk to be managed - creates the true paradox.

## The problem statement

How does an enterprise embrace:

1. The power of automation
2. Across the scale of the cloud (*multi-clouds*) and
3. Within their risk framework that is their measure of operational safety & responsibility?

# The Enterprise Cloud Solution Mindset

Enterprise Cloud is the name of the solution space that is focused on solving for this problem. It must be open to the fact that, the solution has dimensions that are beyond technical; representing a big shift to a new way of working that requires new capabilities that are configured in new ways:

* Moving to this world means becoming competent and successful in “Enterprise & Cloud Automation”
* Recognizing that your competence and success today are mostly obsolete in this new world

It is a hard problem that requires transformational change rather than incremental change.

This requires an operational cadence that can pivot or persevere - it needs to be in motion not static.

The mindset needs to appreciate that better decisions are a function of analytics applied to a volume of data\information - and we will know more in the future than today - so we need to be flexible to new learnings rather than fixed into a plan based on the knowledge of the past.

This requires a leadership style that focuses on articulating the vision, creates the conscious awareness through “language & community” and establishes the environment for talent to find new forms of expression in pursuit of this vision.

It is not for the faint hearted and demands courage, conviction, humility and a beginner’s mind.

However, on the other side of this kind of change is a brave new world …