Safety as Capacity

I have a personal connection with the topic of safety. I grew up in the 60s in a little town called Bhilai in India. It is a town built around a massive integrated steel mill. I remember seeing bill boards like Figure 1 throughout the town and noticing signs, in the mills when we would go on field trips (the Coke Ovens, the Blast Furnace, the Plate mill, the Rail mill etc.), with messages like "Safety Awareness Week", "248 days without an accident" or "Congratulations to Blast Furnace Team! Celebrating 100% on safety inspection" etc. That was my first initiation into the importance of safety measures. Many decades later, on 9th October 2018, my childhood friend, Uday Pandey, fell victim to an industrial accident[1] at the same plant.

Figure 1: *Safety signs in my childhood town*

Safety is a feeling. Technically it is defined as a dynamic non-event. It cannot be measured directly. Safety is not the absence of accidents, but the presence of capacity[2]. That notion of capacity in this context is interesting. While often we use that term to indicate a physical property of an object (e.g. a 5 gallon bucket), here we use it to refer to a system's property that allows it to absorb the uncertainty of an accident while preventing uncontrolled harm.

Several examples are quite illustrative:

• When building and safety department mandates earthquake code compliance, they are creating capacity in the structure to deal with the uncertainty of seismic shaking. Compliance with this code requires extra design, engineering, materials and construction effort and a significant extra cost. But when an earthquake happens, the structure has the capacity to deal with it.

• In the non-fire season, the department of fire must diligently implement activities like dry brush clearance, dead wood removal in forests, training of fire fighters, developing equipment and infrastructure like air tankers, their fire-retardant supplies, staging airports, etc. If these capacity building activities are adequately funded

1. Industrial accident in Bhilai https://www.groundxero.in/wp-content/uploads/2019/04/compiled-BSP-report-pdf_pagenumber.pdf

2. Safety as a presence of capacity – Todd Conklin https://www.youtube.com/watch?v=_qo8hh_Rb1k

and executed in years before a fire ravages a certain section of California, then the system has capacity to deal with a fire.

- In Silicon Valley are some of the giants of the digital economy (e.g. Google, Amazon, eBay, Netflix etc.). In a short period, they have significantly altered the composition of economic activity. When you rely on cloud based computer systems to carry out billions of dollars of business 24X7, you must think hard about disaster preparedness to deal with uncertainty of emergent events. Netflix has invested years and a very large budget with a continuously improving effort to build capacity to deal with such uncertainty. They call it Chaos Engineering and some of the products out of this program (called Chaos Monkey simulations) have been open sourced. By doing this Netflix has built capacity in their system to prevent unpredictable outage events from causing uncontrolled harm.

In the Senior Care domain, accidents could be falls leading to injury to residents or a case of infection entering the facility etc. These unpredictable events will always happen. Developing safety, then is not their absence, but developing a capacity to deal with them without leading to catastrophic outcomes. When analyzed from this perspective, it becomes clear that Senior Care as an industry lacked capacity to deal with the virulent bug (Coronavirus). Once it entered several facilities, it burned through their populations like dry brush as we experience every summer with forest fires in California. It is not so much that people made bad choices, but people had bad choices.

It is easy to understand that when you have to build capacity, it is expensive, takes diligent well directed effort and takes time, but when you don't have capacity, coping with the effects of it is really expensive and takes a very long time (not to mention the loss of precious life). Just like buying insurance is a hedge against financial risk, building capacity is a hedge against systemic risk.

Capacity building, then is a deliberate, well planned and continuously executed activity. Regaining trust after this Covid-19 storm and fostering the feeling of safety will be a capacity building activity. Most importantly, as in the case of insurance, capacity must be built before the risk materializes.

InfeXBloc™ is an operational architecture for a Senior Care facility that will build a capacity to absorb uncertainty of a pandemic.

It will make the facility pandemic resistant. Moving Senior Care facilities to be InfeXBloc™ enabled will then be a capacity building activity.

Digitization of Senior Care

Earlier, we agreed that safety cannot be measured. Unlike a physical object's capacity (our 5 gallon bucket), we cannot measure the Senior Care system's safety. We however, can measure other metrics and publish them in real time in a transparent manner to foster the feeling of safety.

Using Real-Time Dashboards

If a Senior Care facility had a webpage that displayed a dashboard like Figure 2, that could help fostering the feeling of safety.

Figure 2: *A Possible Real-Time Safety Dashboard*

Publishing a Stream of Events

We often emphasize the importance of documentation in a Senior Care facility as a sustainable defense strategy against a liability lawsuit. Underneath that, is the desire to have an immutable chain of events that can paint a chronology to illustrate a diligent effort by the facility. There is a variety of events that occur in a senior care facility:

- ADL assistance events
- Medication delivery events
- Meal delivery events
- Activity events
- Hospital events
- Professional visit events
- Family visitation events
- Tour events
- Fall events
- To bed and wake up events
- Adverse health condition events

- Pictures taken events etc.
- Video streams published with time lag

If a Senior Care facility could curate and publish, with time delay or in real time, such a stream of events (Figure 3), it would go a long way to help relatives feel safe about their loved ones in our care. Needless, to say, we would need to take care of data anonymization to meet HIPAA compliance requirements.

Just like a commercial airliner has 2 "black boxes" (a Cockpit Voice Recorder and Flight Data Recorder) to record the events in real time which are used for forensic analysis in case of an accident, an InfeXBloc™ facility will have 3 black boxes to record the events in that facility in real time. These will be the:

- Audio Data Recorder (ADR) – audio recordings of all streams from the CCTV cameras in the facility
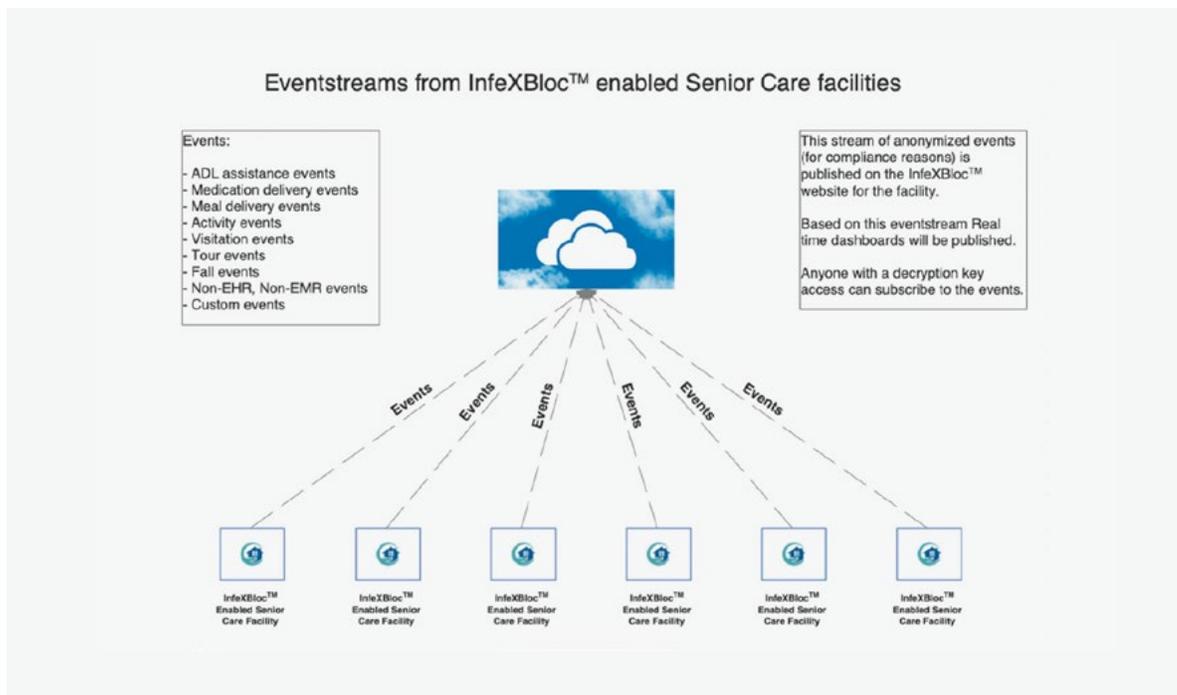

Figure 3: *Events streams from InfeXBloc^TM enabled Senior Care facilities*

- Video Data Recorder (VDR) – video recordings of all streams from the CCTV cameras in the facility

- Events Data Recorder (EDR) – data streams of various types of events in the facility for example security events, visitor's arrival and departure events, tour events, any alarms and reset events, fall events, EMR, EHR events etc.

These will be used for forensic analysis. To ensure privacy needs are met, data from these black boxes could be combined and synchronized by authorized personnel only".

Implications for Litigation

Every facility owner or investor has a secret nightmare of the likely lawsuits that will arise out of this pandemic handling. If we read the tea leaves, Corona virus litigation may make its Tobacco or Asbestos brethren look like child's play. While it is unclear how much help our Insurance companies provide or Congress provides with any umbrella protection, what is clear that regardless of the events of the last 5 months, we owe it to ourselves to build a capacity for the future against this predictable risk. Publishing a stream of immutable events would go a long way. It would make our insurance companies very happy and they may even consider funding such efforts. They have already done so in the world of automotive insurance.

Implications for Licensing, Oversight and Human Capital Management

Our LPAs and Ombudsman often have expectations that parallel those from attorneys. The oversight function is an important one to assure that our senior residents' rights are well protected. An immutable stream of events will go a long way to help this oversight function.
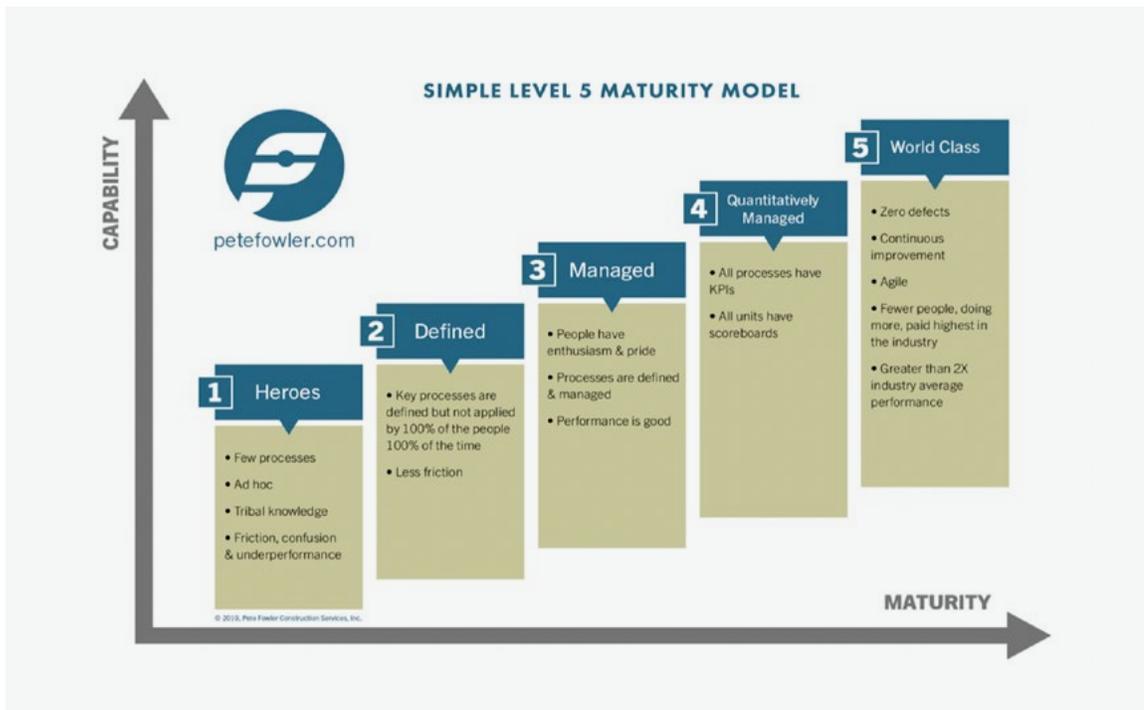

Figure 4: *A 5 Level Maturity Model*

More than anything, our care givers could freely revisit their own event streams and assess their own performance. It would be relatively easy to report their own metrics.

Quantitative Management – An Opportunity

Most industries go through a maturation process which can last multiple decades. For example, e-commerce began in 90's and has matured in nearly 24 years. What starts with low automation, negligible regulation, no standardization, high instance of fraud and overall low trust, eventually arrives at a place where processes are standardized, predictable service is achieved, and quantitative management and zero defect principles are practiced. Along the way, customers benefit from these improvements.

It's debatable where on this continuum (Figure 4), Senior Care as an industry lies. Nevertheless, the Coronavirus pandemic presents us with an unprecedented opportunity to accelerate along the maturity continuum in our industry. InfeXBloc™ architecture was designed to capture the momentum created by this pandemic to help move our industry up this continuum.

Once again, our customers – the residents we serve as well as their families and the communities we serve – will ultimately be the beneficiaries.

For Owners, Operators and Investors

When we build project business plans, we require a risk mitigation strategy. Before this pandemic, most of that was bundled into the 3 insurance coverages desired (Facility liability insurance, Workman's comp insurance, Professional Liability insurance). This pandemic has exposed a systemic weakness and the engine check light for our business model is on. It is incumbent upon us to build capacity to deal with this and strengthen our business model to prepare for the Silver Tsunami.

To learn more about InfeXBloc™ and how your facility can leverage the architecture to move forward, enhance safety, and rebuild trust in a post-pandemic world, check out www.infexbloc.com.

Golden Springs Ranch

About Ashish Warudkar

Ashish has worked in the software industry for 30+ years including 19+ years in the healthcare sector. He also has been an entrepreneur for over two decades and provides consultation to "Golden Springs Ranch" which is an upcoming InfeXBloc™ home in Palmdale, California which will introduce the innovations discussed in this paper to provide its precious residents with a safe happy home and their families with peace of mind.

Ashish Warudkar is trained at:

IIT Bombay	Mechanical Engineering
UCI	Predictive Analytics (7/8)
Harvard	Disruptive Innovation Strategy with Clayton Christensen
MIT	Advanced Certificate for Executives in Management, Innovation & Technology
	Architecture & Systems Engineering of Complex Systems
	Platform Strategy – Building & Thriving A Vibrant Ecosystem
	Business Dynamics – Diagnosing and Solving Complex Business Problems
	Executive Certificate in Strategy and Innovation
Product School	Product Management
BWW	Network Marketing
Oren Klaff	Pitch Mastery

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