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KAIZEN PARADOX II – HOW THE APPLICATION OF KAIZEN PRINCIPLES TO TRANSFORMATIVE TECHNOLOGY DELIVERS REAL INNOVATION

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IS 'INNOVATION' AN OVERUSED WORD? KAIZEN, KAIKAKU AND KAKUSHIN

Today almost any improvement in a company's operations can be described as an 'innovation'. However, this tendency to describe incremental improvements in such lofty terms is clearly more hype than reality. Applying technology that is decades old or far from state-of-the-art may be better than what has been done before, but that does not necessarily earn the label of innovation.

Genuine innovation is rarer than you might believe.

In our first white paper; The Kaizen Paradox: How Incremental Improvements Can Impede Innovation, we introduced two of the three Ks from the Toyota Production System; Kaizen (improvement) and Kaikaku (transformation) and examined the interplay between them.

While Kaizen (literally change + good) is evolutionary, Kaikaku (literally change + transform) is revolutionary. The third K in Japanese is Kakushin, which means 'transform + new'. It is the Japanese word for Innovation.

In business improvement theory Kaizen is a companywide, never-ending process that involves everybody (continuous improvement), whereas Kaikaku has a discrete project timeframe and involves just a few people. Typically, it has a very high impact on productivity through the business, such as the implementation of fully automated processes.

In Japanese business theory Kakushin is not just taking about something, polishing it up and making it slightly better. Nor is it taking an existing solution and applying it to your own business. Every now and then an opportunity occurs to take the Kakushin step; a genuinely innovative approach that solves the problem in an entirely new way.

The simple way of thinking about the distinction between Kaikaku and Kakushin is that the former is something new to you. Kakushin is new to everyone.

In the previous paper we used the example of candlelight; where Kaizen would be improving the candles, Kaikaku would be the application of electric light. In 1879, New South Wales imported several generators to provide arc lighting so that construction of the Garden Palace, being built for the first International Expo, could continue at night. This was a first; a true innovation. And thus began the transformation to the modern era.

Suppose now that you managed a business in Australia toward the end of the 19th century and you made the decision to install electric light. Just imagine what a transformation that would have brought to your business, and what a competitive

advantage you would have gained by being better able to show off your products, staying open and operating for longer hours, while working more accurately and safely. That would have been a Kaikaku leap forward.

You would certainly not have been the first business to make the leap to electric light, and so there is a good chance you would not have invented anything new in the process. So while this example would not have been Kakushin (innovative), you certainly would have transformed your business in a very positive way.

THE KAIZEN PARADOX REVISITED

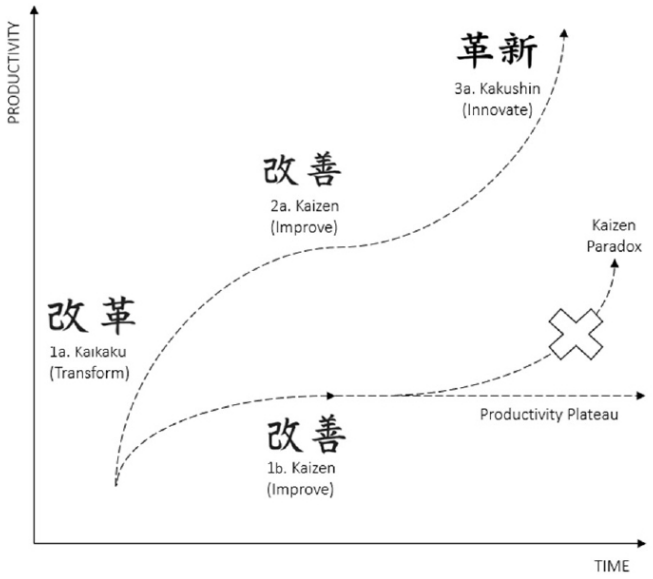
In warehousing and distribution, an example of Kaizen would be moving from a manual, paper-based warehouse to a software and partially automated or mechanized warehouse, possibly with some zone routing conveyor. Kaizen improvements don't transform the underlying process, which involves people going to the goods on the shelf and picking them (person to goods).

Kaizen improves the efficiency and productivity of that process as much as it can by perhaps managing the order tote around the warehouse or by allowing pickers to optimize their travel paths with, for example, voice technology. An example of Kaikaku, on the other hand, would be automating the warehouse so that the goods come to the person (goods to person) or robot, which is a complete reversal of the process and one where both the investment and the gains in productivity are much higher.

In our first white paper on the Kaizen Paradox we discussed the risk companies take when they focus on improving existing processes in favour of transformative technology. That incremental improvement can have the paradoxical effect of making it more challenging to achieve a positive business case for transformative technology (something that the business actually needs long term). We also mentioned that rapidly growing e-commerce companies can and do benefit from this effect by leapfrogging existing and efficient retail players through the rapid deployment of warehouse technology.

What is often seen as complacency in entrenched market leaders may actually be an approach too closely wedded to continuous improvement. Seduced by the short-term gains that can come from relatively modest investments in existing and long-established ways of working, some businesses unwittingly erode the business case for major change by making just enough improvement to chip away at the ROI of a transformation, while more wholesale changes happen in competitors around them. The real threat is from the future, not the present situation, and therefore less tangible for a market leader.

The Kaizen Paradox is a common predicament for many businesses, where small investments are made to achieve productivity gains, but in so doing they dilute the business case for a greater investment, causing them to plateau at a lower level of productivity.



REAL INNOVATION

A genuine leap forward, be it Kaikaku (transformation) or Kakushin (innovation), will deliver system lifetime benefits that far outweigh Kaizen (improvement) on its own.

Paradoxically, however, when looking for opportunities for real innovation, one pathway is to apply Kaizen principles to Kaikaku technology. Indeed, it is possible to make a commitment to a Kaikaku leap forward in performance and then, in the process of investigating options in more detail and developing solutions specific to your needs, make a discovery that leads to real innovation; a new type of solution, or transformative technology combined and deployed in a new way.

This can lead to another dramatic change in performance; one that, rather than implement a system that keeps pace with competitors or catches up with them, gives you market leading performance.

That is the real impact of Kakushin; a leap that takes you past all your competitors and establishes new ground.

"Toyota started by copying the technology of the front-runners. The company has made improvements on the existing technology, which has led to innovation. What's wrong about imitating and improving on others? "

- Akio Toyoda, May 2018

LEAPFROGGING

This leapfrogging phenomenon is often practiced by newer e-commerce enterprises, but applicable in many other industries, and even developing countries. Unencumbered by existing infrastructure, transformative and sometimes innovative leaps abound.

The most famous Japanese Haiku poem of all time was written by **Matsuo Bashō** in **1686**;

Furu ike ya (the old pond)
kawazu tobikomu (frog leaps in)
mizu no oto (sound of water)

Leapfrogging competitors with transformative technology can create a ripple effect that changes the status quo. Once the decision has been taken to make the leap, opportunities to improve and tailor the transformative technology to your specific application may yield real innovation, taking you past all possible competitors.

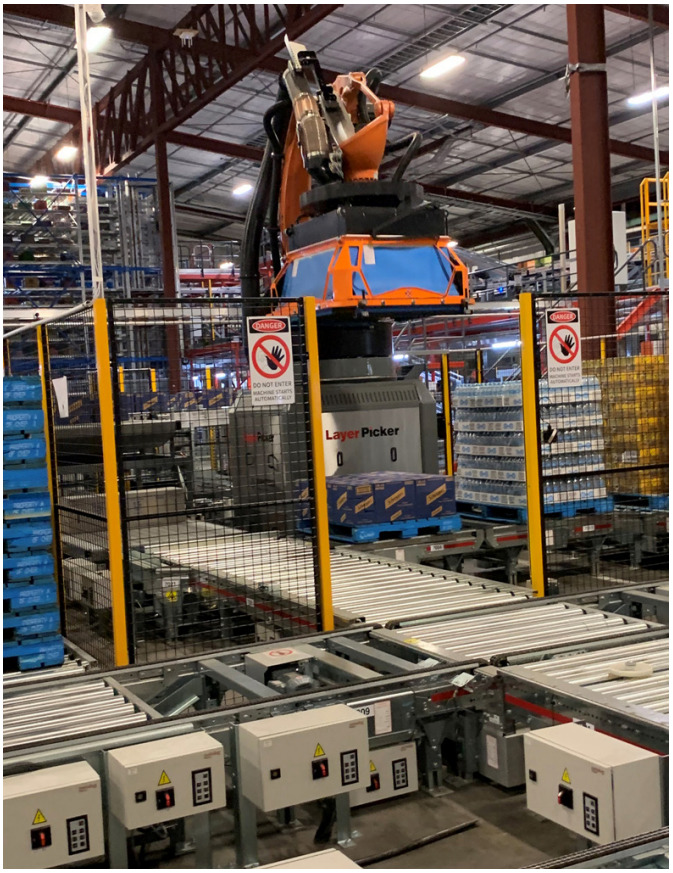
KAKUSHIN; A LOGISTICS EXAMPLE

In a recent real-world example, Swisslog was invited to provide a layer picking robot solution as part of a system design for an existing customer. This solution would deliver a significant boost to quality and efficiency compared to manual (pick to pallet) or mechanized (fork lift with special gripper) layer picking. It was therefore a request for a Kaikaku solution.

Robots have long been applied in layer picking systems, and the technology is readily available from multiple vendors, so what the customer initially requested was transformative but not innovative. The major step forward came from looking at ways of making this customer's robotic layer picking system a lower cost, cleaner, more flexible and more efficient solution. By definition, we were applying Kaizen principles to the activities of the future robotic system to make the most of what the robot could do and thus increase the attractiveness of the overall solution.

At the time, all layer picking robot solutions relied on conveyor systems. Because these systems are permanently fixed to the ground, it can be more difficult to access the robot for maintenance, while in a food or drink handling environment, the floor under conveyors can be difficult to keep clean. Upon closer examination, conveyors hampered the robot's speed and efficiency, e.g., there were only eight locations where a pallet can be placed and at times the robot can operate faster than pallets can be replaced by conveyor. Finally, once installed, conveyor-based solutions are inflexible and not quick or easy to expand or modify.

Applying Kaizen principles to the robot solution, focusing on helping the robot achieve its maximum efficiency, lead to an entirely new solution. 'CarryStar' takes existing technology, order picking robots (something quite transformational as they are 10 to 20 times more cost effective than manual pickers in a 24/7 environment), and combines them with automated mobile robots (AMRs), removing the need for conveyors completely.



This improvement was a brand new solution, one that reduces system cost, improves maintainability and cleanliness, and supports resilience because if one of the AMRs goes off line all the others can keep working.

By arranging the pallets in a circle around the robot instead of the square conveyor arrangement, in some applications more products could fit and more orders could be picked at one time, which reduces downtime and improving performance.

CARRYSTAR, NEW + TRANSFORMATIVE (INNOVATIVE) LOGISTICS SYSTEM

While refining the solution for this specific application, it was quickly realised that the solution could have much wider applications. Solution patents are relatively rare, yet we also found that because it was new and solved real problems, we could protect this innovation with a global patent and broaden its applications.

CarryStar is now at the core of a new range of warehouse solutions that are easily expandable to encompass both roaming and enclosed versions, as well as tackling many other jobs in the warehouse.

This new and transformative process is an example of real innovation in warehouse technology. It was derived from evaluating current best practices and then trying to find new solutions to improve on them; by applying Kaizen principles to Kaikaku transformational technology to create something new and better - Kakushin.

The door to real innovation was opened by a customer who was willing to take the leap and open-minded enough to consider something entirely new.

APPROACHES TO SUPPORT BUSINESS TRANSFORMATION

Many companies start by trying to improve a manual operation that they intend to get rid of eventually, and this can ironically hold them back. If there is an ROI that looks positive for transformative automation, if there is a solution that suits your business, and if your intention is to invest in that technology, the best thing a company can do is make a high-level decision to invest now.

For many of the most successful organizations, major leaps forward in performance are approached strategically; Kaikaku investment before Kaizen improvement. Once an organisation is committed to Kaikaku, then to using current best practice and taking it one step further, you open the door to potential Kakushin.

Kaizen still has its place, for example, in looking to improve on an existing automation design and finding new solutions, and by continuing to improve once your business has made the transformation to a new level of performance.

Toyota is credited with starting by learning from others, then moving on to find ways to innovate. And in logistics, innovation comes from professionals with deep understanding of the current state of the art, but with an eye for developing a solution that is a perfect fit for your specific operational requirements and issues rather than always proposing what others have done.

> Long term, successful organisations are in a perpetual circle of transformation, innovation and improvement.

These are the partners you should seek out when looking to make a radical change in your business performance; Kaikaku, but with the best opportunity to uncover Kakushin.

While incumbents find Kaizen the easy path, it takes a more visionary hand to make the business case for radical change. Time and again, history has shown us that bold steps are the key to unlocking future performance; of being the leaping frog rather than the stationary lily pad.

RECOMMENDATIONS FOR BOARDS AND MANAGERS

Before embarking on a technology path or even selecting a building, businesses should consider their long-term requirements and how technology could be implemented. Innovation may be achievable in phases if planned from the start, while use of an Industry 4.0 approach and modular systems can significantly mitigate long term business risks.

Once organisations are aware of the potential for investments that create a Kaizen Paradox, they are better able to consider potential improvements as part of a larger, longer term picture that permits genuine innovation.

Strategic improvement plans are more robust when they consider costs that could have been avoided. These could include land and buildings, equipment, labour, even the cost or service level issues associated with pick errors and returns.

There should be agreement at senior levels that any innovative leaps identified are critical to success, and must be planned and scheduled properly to optimise ROI and avoid plateauing or future wastage.

In developing their optimal plan, organizations can develop a well defined gap analysis, outlining the incremental improvements and innovative leaps they need to either catch up with global leaders or take the global lead in their industry. The organisation should have confidence that it has the capability to close these gaps as quickly as possible, or can engage partners with the required experience.

As part of that approach, meetings and site tours with industry leaders and technology partners can provide awareness of current KPIs that are achievable for key processes within an operation.

As businesses we can always improve, but not all improvements are complementary or equal. Improvement strategy, continuously reviewed, is critical to the organisation's long term competitiveness.

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