KATA, KAIZEN, KAIRYO:

Applying lean principles during times of transition helps the problem-solving mindset evolve into trust and teamwork.

A STORY OF GRIT, GROWTH, AND GREAT RESULTS

JULIE SAVAGE-FOURNIER

Health care is an industry where highly skilled professionals interact with one another to provide services to different individuals with unique characteristics. It is not an easy feat to normalize such a customized service. When we think of critical care, particularly in the surgical suites, everyone has to be ready to react to an emergency, as it could be a matter of life and death. Understandably, during organizational transition, delegating tasks to another care team can be a source of stress. The level of stress may increase when the whole clinical team moves into a brand-new building that has been designed to radically change the way people work.

In the case of our organization, surgeons and nurses had no other choice but to trust new collaborators because they could not go back to how things were. Despite great work in change management and space design by the construction team, including visits and simulations, moving into this new environment was a shock. There were many processes that worked on paper, but it was important to apply theory to practice. Add that task to the legitimate discomfort of moving into an unfamiliar place and you can imagine the struggle of everyone involved.

There were hiccups, exacerbated by the presence of new players on the team and a trust relationship to build. The challenge was to make things work and make them work fast. It is not every day that implementing logistics and inventory management systems has such a direct impact on people's well-being. The task can seem unachievable when, for example, loads of unexpected supplies entered the storage area on moving day and 1,500 SKUs (store-keeping units which refer to specific product models and packaging) are expected but almost double that number showed up. However, by keeping a cool head and applying a few lean principles, the mission was accomplished.

The first phase (*kata*) was all about getting the basic process under control; it took 10 weeks to achieve a stable and sustainable state. The next phase was a *kaizen* because many teams had to work together and learn

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EXHIBIT 1 Definitions of *Kata*, *Kaizen*, and *Kairyo*

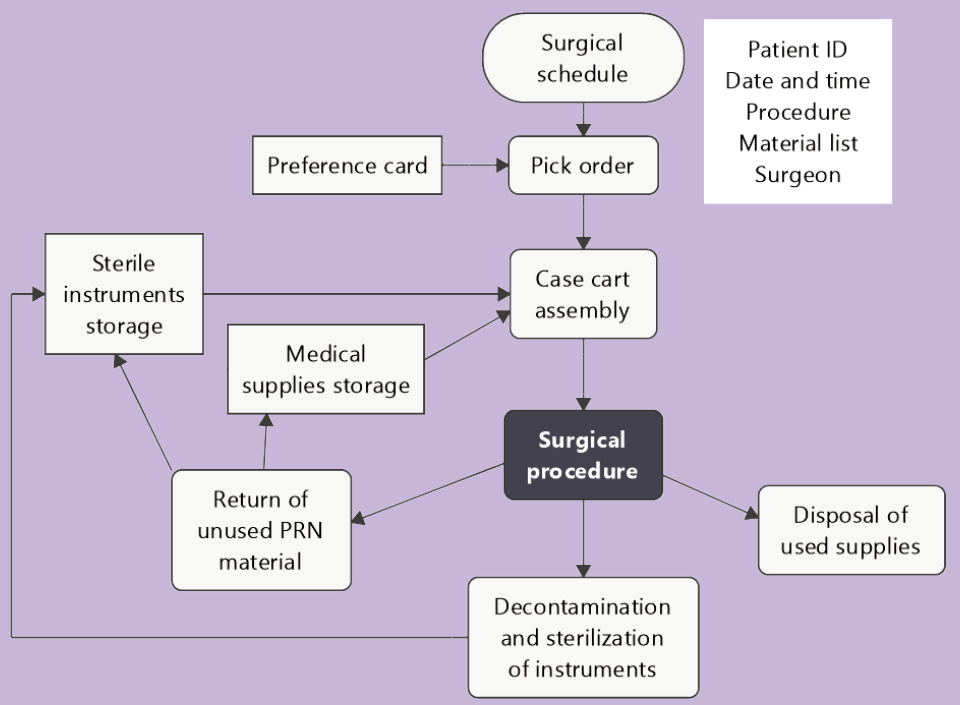
Kata: a combination of positions and movements meant to be repeated regularly as an exercise

Kaizen: continuing improvement of all the aspects of one's life; it can refer to personal development as well as professional development

Kairyo: continuing improvements through technology, processes, and organizational values

Data from: Nakamuro, J., "Kaizen: Lost in translation," LinkedIn (Feb 8, 2016). Available at: https://www.linkedin.com/pulse/kaizen-lost-translation-jun-nakamuro-1/.

EXHIBIT 2 Workflow

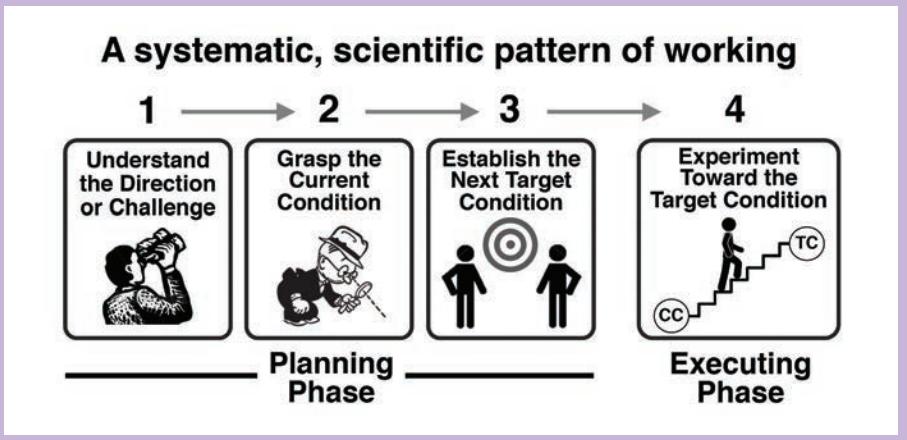


to rely on each other. The last phase was to implement solutions from the *kaizen* and build up a continuous improvement and collaboration culture. This article will go through all these phases and their outcomes. (Exhibit 1 defines these terms.)

Establish the new workflow through *kata*

In the new way of working (shown in Exhibit 2), material supplies were no longer freely accessible during surgery. The new surgical suite's floor plan was bigger and met newer standards, but the walking distance to reach supplies increased. Before the move, nurses prepared the material required for surgery themselves, but this task was replaced with sending a pickup order for the material to be prepared by store attendants. Surgical preference cards were completed ahead of time to help prepare the correct list of materials.

EXHIBIT 3 The Four Steps of the Improvement *Kata* Model



Data from: Rother, M. *The Toyota Kata Practice Guide*. (New York: McGraw-Hill Education, 2017).

EXHIBIT 4 Examples of Waste Problems and Solutions

Waste	Initial Situation	Final Situation
Inventory	Inventory in the self-service area	Creation of small safety stock for each room. Reduction of inventory in the self-service area. The total inventory accessible to nurses dropped by 40 percent.
Motion	Nurses were spending 5 percent of their time going to pick up materials	This was eliminated and it freed up the nursing-time equivalent of three to four full-time positions.
Overprocessing	Picking and returning unused materials	The reduction in PRN to pick and return freed up two full-time logistics positions that were redeployed to other tasks.

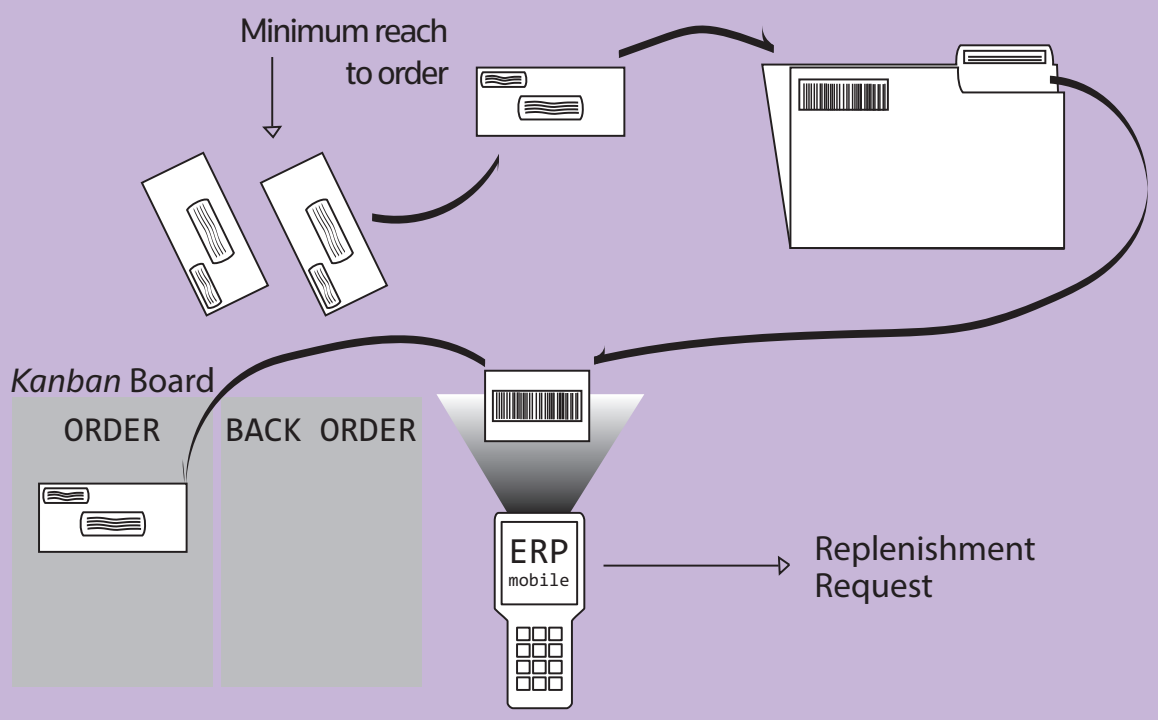
The order process may seem like a very straightforward logistical process; however, at the time, due to the impossibility of interrupting surgical services in the hospital and the need to ramp up quickly in the new pavilion, the first end-to-end test occurred when an actual patient was on the table for surgery. No patients were harmed during the process; however, many people did sweat to fix everything as they were going.

The *kata* strategy (shown in Exhibit 3) was useful to support that phase as the quick iterative process was a key to the ambitious timeline of the move.

1. *The challenge:* Ramp up the surgical services in the new facility and to get back to the regular volume of surgery in six weeks.
2. *The current condition:* Many obstacles were interfering with the process flow.
3. *The next target condition:* Choose one obstacle to move out of the way.
4. *Iterations toward target condition:* A daily status meeting helped follow the progress of the trials and identify new issues and actions.

Measuring daily progress and creating a quick feedback loop clearly helped keep everyone focused. There are situations

EXHIBIT 5 *Kanban* Process



where the big picture is overwhelming, and keeping momentum requires believing in the next small step.

After this succeeded, we learned that the benchmark for such an implementation was 18 months, which validates this quote from Mark Twain: "They did not know it was impossible, so they did it."

Kata learning: Developing a common language to communicate

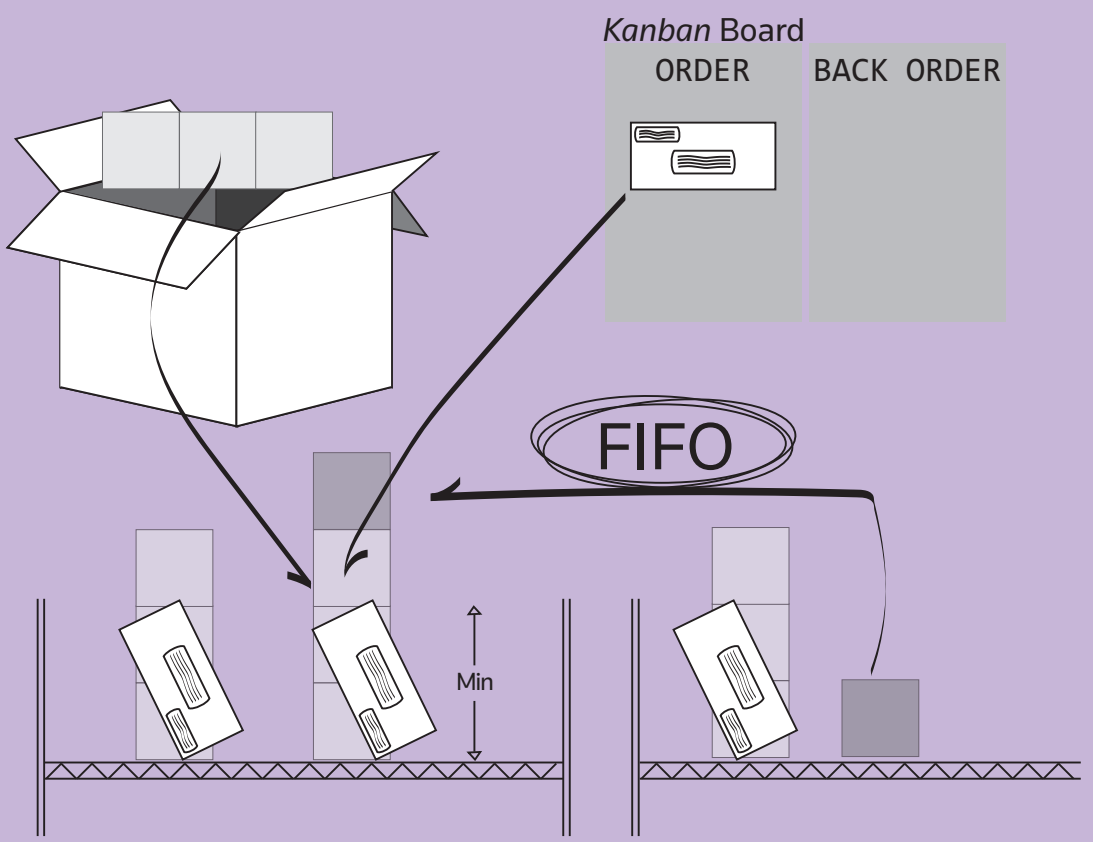
The preference cards were one of the major obstacles during the transition. Clinicians were moving from a setup where supplies were kept in the surgical theater and available at their fingertips to a setup where they had to plan their needs. Nurses had the task of making a list of the supplies required by each surgeon for each procedure. It was a tremendous effort to provide all the material lists and input them into the information system; the result was more than 3,000 bills of materials.

Then, these lists had to be maintained and kept up to date. A large part of the challenge was that instead of taking the blue clip from the left drawer, someone now had to find the name of this specific item in the enterprise resource planning (ERP) system (for example, 12 mm latex-free ligature) within hundreds of clips and ligature systems, and then communicate an eight-digit product code to the storeroom. Of course, a simpler solution was required.

Storekeepers and buyers had much more experience with the ERP system than the nurses, and together they found an efficient and easy way to collaborate: Nurses would collect the supplies needed and place them into a bin, and then the product codes and quantities were provided by the logistics team. The accuracy of the orders rose from 47 percent to 99 percent in the span of a few weeks.

Improving the preference cards, in a way that was easy and convenient for nurses, was a large part of getting the process under control. To achieve this result, everyone had to recognize the expertise of one another and bring to the table what they do best to support each other. This strategy is in line

EXHIBIT 5 *Kanban* Process, continued



with *Toyota Production System (TPS) Principle #11:* Respect your extended network of partners and suppliers by challenging them and helping them improve.

***Kata* learning: Setting standards improves quality.** The case cart model in surgical suites is a widely used standard for managing the material required and improving the cost per case accuracy. This practice also helps to prevent infections as the supplies are only exposed to the specific patient at hand.

The first delivered case carts were sadly not up to everyone's expectations. The small supplies were mixed together, and it was hard to find them for a proper setup in the surgical theater. The orders contained a quantity of products required for the procedure and the PRN quantity (from Latin *pro re nata*, which translated means "as required").

The need to separate the minimum required supplies and the PRN was quickly identified; two colors of bins were purchased to easily identify each category of supplies. The PRN bins also prevented contamination of the extra supplies so they could be returned in stock and credited.

A standard setup of carts was also designed in collaboration between the logistics and nursing teams. The type of material going on each shelf was identified, and even the advice of an occupational therapist was sought. This is how we realized that the logistics team was mostly tall people and the nursing team was, on average, short people. The ergonomic height for heavy material was slightly different between the ones putting the material on the carts and the group taking it off.

Creating a standard setup chart helped reduce time spent by nurses verifying the material on the cart and improved setup time for surgery, which resulted in a quicker turnover between cases. It also improved workplace safety by respecting everyone's ergonomic needs.

GEMBA

The place where value is added, which means where the actual work is done.

KANBAN

The word means "sign" and it is referring to using visual cues to trigger an action.

TPS Principle # 6: Standardized tasks are the foundation for continuous improvements and employee empowerment.

Plant the *kaizen* seed, let *kairyo* bloom. Once the new workflow was functional, it was time to reflect on how well the new system was meeting the needs of the clinicians. This is when the *kaizen* event took place. In addition to the solutions designed in collaboration between all the departments, this event changed the workplace morale by opening regular communication channels between the groups. The transparency and problem-solving mindset evolved into trust and teamwork. This foundation enabled more improvements down the line. The lasting effect of working together and fixing things as they came led to the famous culture change everyone likes to talk about. See Exhibit 4 for additional examples of waste problems and solutions.

Creating waste or reducing waste? The need for easily accessible material near the operation theater was expressed. The surgeons had identified that nurses leaving the room for an unknown time was a stress for them. Additionally, the quantity of returned material was an overload for the logistics team and nurses needed the safety net of extra material in the case of contamination, an emergency during surgery, or any other event that would require more supplies. Basically, the clinicians wanted their cupboard back in the room.

Some people will say that creating a stock for each room is wasteful. However, due to the legitimate reasons for requiring that stock, the strategy had to be minimizing the waste. This also presented the opportunity of significantly reducing the general safety stock in the core area of the sterile storage space. A key factor here was to control this security stock so it would not expand.

While on a *gemba* walk, the team noticed some drawer units on wheels that were standard for patient care. They had been left behind during the move by another care unit that moved into a new layout and did not need them anymore. They were deemed too small for the quantity of supplies nurses wanted by their side, but they were free and available immediately. We agreed to try the concept right away and observe the results — there started some more *kata* cycles.

After the trials, it appeared that the necessary adjustments were needed for the layout of the drawers, the supplies to keep in the cupboards, and the replenishment frequency. The nice thing about these findings was that additional space for more inventory was not required, so we could keep it to a minimum.

Working together toward the best solution, keeping an open mind and being flexible, and challenging assumptions and bias: These are great illustrations of how individuals can grow in the lean process. As a reward for all that work, the waste was actually significantly reduced as well.

***Kanban* is not just another "K" word.** *TPS Principle # 3:* Use the "Pull" system to avoid overproduction.

In our case, even after the reduction, the self-service inventory remained substantial with over 2,000 SKUs to replenish on a short cycle and to keep inventory low. Most technological solutions were put aside due to the recording of each material movement being impractical.

TPS Principle # 7: Use visual control so no problems are hidden.

The double bin system is very common in such a situation, and it was not possible to implement it in most of the storage locations. As shown in Exhibit 5, the double bin is an application of *kanban*, which involved colored cards when it was first implemented by Taiichi Ohno. The experimentations began with colored cards and how they could be used to replenish the supplies.

Going to the basics with simple cards and labels allowed a lot of flexibility in experimenting with the replenishment system. Each surgical specialty had a color to differentiate their supplies; the color coding was applied to the cards and the storage sections. The modifications and adjustments were easy and were being made on the spot. It is counterintuitive that such

STANDARDIZED TASKS ARE THE FOUNDATION FOR CONTINUOUS IMPROVEMENTS AND EMPLOYEE EMPOWERMENT.

a simple system could be more effective than technology to manage a large stockroom. Thanks to the simple cards, most of the gains of a complex system were achieved with negligible investment.

The communication of the order status of products to logistics staff and nurses was also facilitated as the cards of the products on order and backordered were displayed on a board until they could be received. A nurse in charge of a surgical specialty could easily see the status of her stock and fix any issues of shortages with the storekeeper.

To maintain all this progress and go further, the communication and teamwork had to continue being supported through regular meetings, daily feedback, displayed A3 reports, and *kata* boards.

Does it end there?

A real commitment to lean principles and the regular practice of *kata* led to more performant processes, but it also profoundly changed the way we work.

There is always room to improve and new factors that need some adaptation. Practicing the habit of regular improvements and cooperation prepared the team to face other challenges coming along. For example, with this way of working, the team could set up the supply chain and material storage for a new type of overspecialized surgical procedure in less than a week.

The project is closed, the processes are implemented, and the show is running. However, the improvement journey is not ending anytime soon! There is always more to come. ■