Seizing opportunities for change at the operational level

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Abstract

Purpose – This paper presents a method for handling everyday opportunities for improvement, led by floor staff in healthcare institutions. More than 400,000 incidents and accidents were recorded in Quebec healthcare institutions in 2013. The burden of treatment falls on hospital floor staff. The purpose of this paper is to raise the visibility of this problem and support staff better in their efforts to handle opportunities for improvement.

Design/methodology/approach – Based on issues identified in the literature, which have been found to exist in various organizations, the method involved reviewing practices in the field, proposing a solution, and testing it to assess its relevance and limitations. The method was tested in partnership with the Centre Hospitalier de l’Université de Montréal, in the internal medicine unit at Hôtel-Dieu campus. The test lasted three months. Indicators from this test have been compared to results in the literature.

Findings – The proposed method presents a 68 per cent increase in ideas generated per person and per week compared to the reference study. The mean time for closing actions was about 41 per cent better (lower) than in the reference case.

Research limitations/implications – The test lasted 15 weeks; a longer test is needed to collect more data.

Practical implications – The first practical implication of this study was the creation of a method allowing employees to seize opportunities for improvement in their daily work. The application of this method revealed: first, the operational nature of the proposal (empowerment of the work team); second, the operationalization of continuous improvement (71 per cent of ideas were finalized while the initiative was monitored); third, the smooth operation of the mechanism for facilitating continuous improvement (organization of weekly meetings and team participation in these meetings in 90 per cent of cases); and fourth, a shared feeling that intra- and inter-team communication had been strengthened.

Originality/value – The main value of this paper is that it proposes a simple problem-solving process that gives employees an opportunity to improve their daily work. The originality of this paper resides in comparing results to a standard case and observing an improvement. This paper proposes a new problem-solving structure and tests it scientifically.

Keywords Evidence-based practice, Organizational change, Continuous quality improvement, Employee involvement

Paper type Research paper

Introduction

Continuous improvement is defined as a permanent effort to develop a system for producing goods and/or services that reduces waste. However, managers in many organizations find it difficult to sustainably implement a problem-solving method and facilitate floor staff’s work. Designing and using continuous improvement methods vary substantially from one site to another and one department to another. Long experience with deploying problem-solving approaches in industry makes it possible to identify the classic difficulties affecting implementation, which include: first,
poor managerial support; second, not involving front-line staff; and third, discontinuous improvement efforts. Inadequate support from managers was analysed in some depth by Lindquist (2011) who identified two sub-factors that cause improvement initiatives to fail: first, not creating a permanent progress support team. Consequently, the improvement groups’ local actions suffer from poor visibility and low priority and changes are not enacted; and second, when managers do not know how to link improvement objectives to the organization’s strategic plan. This means that the actions taken are not important for the organization’s strategy and thus should not have been taken at all.

Not involving front-line staff is emphasized in Robinson and Schroeder’s (2009) study. One factor that explains an improvement initiative failure is employee who are not committed to creating an improvement culture, which has two main causes: first, managers only allow employees to participate in these initiatives to a limited extent; and second, executive officers needing to find projects that lead to significant improvements, thereby ruling out the small improvements that front-line employees are able to make.

Discontinuous improvement efforts are also highlighted by Robinson and Schroeder (2009), who point to another reason why improvement projects fail: neglecting to integrate improvement initiatives into daily activities. The consequence is that improvement efforts lack continuity and staff members on the ground become disillusioned with improvement methods. The healthcare sector is not immune to these problems. There are champions, such as the ground-breaking ThedaCare hospitals, Wisconsin, which are associated with the Mayo Clinic. However, in many institutions, the unit manager has never sought to formalize and facilitate discussions with the care teams to handle improvement opportunities. Consequently, because they do not see the changes as legitimate, the employees are reluctant to commit and it is not uncommon to hear remarks such as “lean six sigma is only for the manufacturing world” (Feng and Manuel, 2007, p. 544) or “this is not a data driven organization” (Feng and Manuel, 2007, p. 544). Starting from these findings, we answer the following question: how can front-line employees be given the opportunity to suggest and participate in improvements and make this a habit in their daily work? Our objectives are to: first, build a problem-solving method that answers this question, second, test it in a hospital setting and third, compare participation and suggestion results with the literature. To undertake the comparison, we monitor ideas per person per week and the mean time for closing actions.

Literature review
Our work was structured around the failure factors mentioned in the introduction. Several authors have worked on this issue and have presented interesting results that inspired us in constructing our method. Savageau (1996) said that empowering employees and creating improvement groups are important. To do this, a suggestion system and a decentralized process for managing the suggestions is needed. Management responsibility is assigned to the senior floor supervisor, who is able to approve simple ideas that focus on the workstation or floor. This supervisor is immediately able to start managing the action associated with the idea. He or she can create a work team for more complicated ideas, pass an idea up to a higher level when s/he has insufficient authority or resources to approve or reject the idea, giving reasons for rejection. In such active-participation suggestion systems, all ideas are acknowledged and the idea’s author is guided through the process. Additionally, a recognition programme is created to ensure the initiative’s success, which is
measured by quality, quantity, response time and implementing ideas. According to Savageau’s study, this management method, in which employees actively provide suggestions and solutions, favours communication between employees and managers. The former are informed of the organization’s goals and encouraged to suggest ideas that will help achieve them, while the latter can focus on a management style that serves their employees.

Robinson and Schroeder (2009) identified that operationalizing the continuous improvement initiative was an essential success factor. In high-performance suggestion systems, ideas for improvement are integrated into daily operations. The ideas are simple and focus on measurable performance indicators that in turn are coherent with the organization’s overall goals. Employees are responsible for managing ideas. Facilitation takes place every day thanks to daily meetings at all organization levels, at which proposed ideas are reviewed along with associated balanced score cards. According to Robinson and Schroeder, these factors make a continuous improvement approach sustainable and integrate it into the corporate culture.

In the healthcare sector, Warda (2009) presented a method to move from a project-centred approach to a true improvement culture. Warda organized his method in three steps: first, setting the right corporate direction; i.e., the mission, values and vision must include excellence and continuous improvement, failing which, employees have no mission to improve quality; second, walk the talk by orienting staff towards change that will lead to continuous improvement; third, employee empowerment. According to Warda, the employee empowerment step has four components: personal development; implementing problem-solving tools; creating a punishment-free environment; and developing a management style that serves quality (servant leadership). These studies present theoretical concepts, which demonstrate that empowering teams and operationalizing proposed actions are important. Other authors present successful experiments related to implementing their local continuous improvement approach.

In On the Mend, Toussaint et al. (2010) present a structured method to implement continuous improvement in the Wisconsin ThedaCare hospitals. To explain their initiative’s success, the authors emphasize several key factors: first, cross-cutting, multidisciplinary teams are important; second, destroying the shame and blame culture so that defects can be identified, their continuous improvement initiative to be deployed provisionally and to be based on a problem-solving approach; fourth, creating work standards for managers and standardizing everything that occurs upstream and downstream of the “middle flow” (the point when the doctor examines the patient) constitute common practices in lean systems; fifth, recognizing employee efforts and committing to a succession programme. These factors ensure long-term buy-in, constantly renewing the capacity for action. Toussaint et al.’s (2010) method is based on the rapid improvement event (RIE; a one-week project that aims to solve an operational problem. When an RIE is started, a multidisciplinary project team is set up, which must include floor and support staff, and one outside person (a patient, an employee from another department, etc.). Teams include 12 people. Before the RIE, a manager sets the project objectives, collects the data and informs team members.

Day 1: the team is trained to use continuous improvement tools and acquires detailed project information.
Day 2: the team identifies the actual and ideal situations.
Day 3: they conduct trials to implement the ideal situation.
Day 4: they write up the new work standards.
Day 5: they report their results to managers and employees.
Thus, RIE is a *kaizen* (ongoing local improvement in small steps), renamed for the occasion. Toussaint *et al.* (2010) also present a tool called A3, which constitutes a one-page 8D problem-solving approach summary used at Chrysler, Ford and GM. This tool structures problem solving by helping the work group focus on describing the problem, discovering its root cause, identifying permanent corrective and preventive measures, and choosing the actions to implement those measures. The tool is called A3 because it is done on one A3 sheet, thus avoiding unnecessary length. Jacobson *et al.* (2009) demonstrate a *kaizen* method applied in the emergency department at Vanderbilt University Medical Center, Nashville, Tennessee. The authors designed a simple method that does not require a large time investment. They encouraged employees to suggest ideas, identify problems and be part of the solution. In their view, all ideas should receive a response, every success should be publicly acknowledged and most employees should participate. The authors sought to create a continuous improvement programme that would be easy to apply, sustainable and effective at encouraging employees to participate every day. Results revealed 375 ideas that were suggested during phase II (from 2006 to 2008), employees averaged 6.9 ideas each during phase II and the cycle time for an idea from beginning to end was approximately 71.5 days. According to Jacobson *et al.* (2009) the system is still widely used in the unit and total suggestions remains relatively stable. Like Deming (1986), the authors found that inefficiency or quality defects are mainly due to process problems. Deming estimated an 85 per cent figure, whereas Jacobson *et al.*, found 76 per cent. They also found that the remaining errors (24 per cent) were caused by human mistakes (Deming assesses this factor at 15 per cent). According to Jacobson *et al.*’s (2009) analysis, sustainability and involving physicians and floor staff are the key factors in programme success. They concluded that the programme created a new culture and the problems identified were addressed officially and transparently. Nevertheless, they could not be certain that services had improved in the unit because metrics were insufficient.

Lindquist (2011) analysed the poor success rates for continuous improvement programmes and the positive impact that certain simple tools can have. The author acknowledges that continuous improvement initiatives can provoke psychological reticence. Such initiatives often fail owing to poor preparation and support for changes. To mitigate the problem, he proposes adopting three simple but structural measures that reassure employees:

1. **Checklists:** these are used at two points. The first designs an action to ensure that the action does indeed target the object for which it was designed. A checklist can also serve as a guide for the people who have to apply the action and a reassuring benchmark to avoid errors.

2. **Audits,** which have three uses: first, an audit after the fact can ensure that the problem and the action were properly matched; second, an audit also allows one to test an action’s sustainability over time; and third, audits show that managers are interested in the actions that have been taken and thus in continuous improvement. According to Lindquist, multilevel audits are powerful motivational tools.

3. **Group problem solving:** implementing a problem-solving process within an organization gives front-line employees a chance to solve everyday problems. According to Lindquist, these tools allow floor staff to set actions in motion, while being supported and supervised by managers. Nevertheless, the command chain’s...
involvement is critical to success. Disinterested managers signal that changes and employee opinions are unimportant, thereby making change impossible. This literature review focuses on the conditions that must in place to support continuous improvement. It also identified several methods and tools that can structure continuous improvement. In particular, we note that front-line workers must be at the continuous improvement’s centre, as creators, promoters and principal actors. To avoid casting them adrift, they must be organized, specifically around a problem-solving process that is applied every day. The proposed method should be a flexible framework for suggestions that is non-judgemental but solidly structured and easy to apply in ongoing operations. Ground staff must also be supported by their managers. The factors supporting audits by managers must therefore be designed at the same time as the continuous improvement method.

**Problem-solving method: STARS**

Our method is intended for floor staff and front-line managers. The action perimeter is a department or zone within an organization. It is designed to function with a 20-person team. Depending on organization size, it may be necessary to apply the proposed method more than once. The method is a five-step problem-solving process that targets actions over a one- to two-week duration. Thus, the aim is to find daily opportunities for improvement, as in Toussaint et al.’s (2010) RIE method and Jacobson et al.’s (2009) kaizen approach. If the process is to remain interesting, then it must be facilitated as Warda (2009) and Lindquist (2011) point out. It is therefore accompanied by an overall management guide for managers and another one for action teams on the ground. We think that it is important to allow ideas to emerge to get the ideas’ creators involved in action. This connection makes them accountable and gives them a grip on the potential irritant, allowing the desired change to be implemented in daily operations. Our method impels floor staff to move from spectators to improvers. The programme is presented in three parts: the five-star process; associated data; and daily support and facilitation. The five-star process is designated by the acronym STARS:

- **Store** enables the person who has an idea to express it and record it in an appropriate format. This record is called an improvement card and can be in paper or electronic form. Without a record, the observation will not lead anywhere. Every card created will translate improvement ideas into action. The steps in a card’s life cycle are the steps in the continuous improvement process.

- **Tag** is the step that assigns the card to a support person and potentially allows it to be enacted. The tagging process’s first part enables the person who submits the observation to gain internal support so the improvement can be moved forward. The second part allows multiple observations to be processed. If several people make the same observation, they are grouped together to avoid an avalanche of defect notifications.

- **The Analyse step** is centred on discovering the observation’s cause. This analysis must be as complete as possible within a reasonable time. The objective is not to engage in an expedited improvement or to conduct an investigation; instead, it is to understand what action must be taken so that the observation is not repeated (in a negative observation case) or is maintained (in a positive observation case).

- **Resolve** is the improvement’s heart. An action must be easy to implement and must remain within the zone’s boundaries where the method is deployed.
The action may be deployed by the card’s author, the support person or another person. The STA steps make it possible to appropriately prepare for the improvement action, while in the R step the problem is solved.

- Finally, the Sustain step closes the improvement card and ends its life cycle. Closure occurs when the action is audited and the desired effects are produced. A new card is issued for the same observation if the previous action failed. This audit supports the management chain’s involvement in problem solving (Lindquist, 2011).

Different data are needed for each step. The most essential (coded E) allow the process to exist. Other data (coded F) are used to facilitate the process.

In the Store step:
- E data describe the observation and possibly a photo and observation site; and
- F data names the person who made the observation, the date the observation is recorded and its nature.

In the Tag step:
- E data comprise the problem with which the observation is tagged (one problem may generate several observations) and the partner who will join the improvement team. Thus, the problem will be addressed by at least two people.
- F data comprise the date when the tagging was done and the performance indicators affected.

In the Analyse step:
- E data describe the problem, following the Five Whys technique if possible; and
- F data comprise the partner and author’s signatures and the date the analysis is recorded.

In the Resolve step:
- E data describe the action, the partner and author’s signatures and the date the action is recorded.
- F data comprise the anticipated performance and the deployment plan (date, place). With these data, any delay in implementing the action can be identified.

In the Sustain step:
- E data comprise the audit date and auditor and auditee signatures; and
- F data describe the feedback given by the auditor about the action taken and its execution.

To represent data, we suggest using supports in the form of cards and tables, known as process tables. Figure 1 illustrates a card, while Figure 2 shows a process table.

Cards: every observation is associated with a recording and processing card, which has five sections (that represent the five-star process steps) and is used to track how the observation is handled.

The observation is also coded in an emblem to make it easier to facilitate the process. The version presented in Figure 1 has four action categories: people; quality; execution speed; and costs. It is a visual reminder that improvement actions must concern
operational objectives that benefit the organization and clients rather than employees. Tables: each card launches a data structure supporting the five-star process. There is a physical mechanism to ensure the flow process: a table in which the cards are positioned. The table has five columns related to the five steps in the continuous improvement process. Each column contains the cards that are at that stage in the process. The table is the central visual element in the ongoing facilitation each day (Figure 2).

Process facilitation, which depends on the two tools: cards and tables. The cycle time for a card to move from the first to the fifth star is one- to two-weeks for simple ideas. Idea facilitation takes place at different hierarchical levels at different frequencies: daily, weekly and monthly (Lindquist, 2011):

- Each day, at an operational review meeting, the method officer checks a card’s progress with front-line staff. This meeting should last about five minutes. The people responsible for advancing each card are its author and the partner. The method officer executes this review only to encourage the participants to move their ideas forward and support certain initiatives.

- Each week, at a departmental meeting, the department head reviews all actions. This progress review is done with the method officer and floor staff. It should take about 15 minutes. This is when the cards to be closed are audited.

- Each month, at an operational meeting, a manager audits the improvement actions. This audit should be about one-hour long. The method’s daily functioning is also reviewed (actions at each stage, ideas renewal, etc.). Statistics are available to facilitators.

In association with these three review levels, specific audits can be performed when deemed necessary. During audits, card status at any stage can be analysed. Recommendations can be issued to adjust the method if necessary.

**Testing the method in a hospital setting**

In an action research perspective, this method has been proposed to the internal medicine unit at Hôtel-Dieu de Montréal, a Centre Hospitalier de l’Université De
<table>
<thead>
<tr>
<th></th>
<th>STORE</th>
<th>TAG</th>
<th>ANALYSE</th>
<th>RESOLVE</th>
<th>SUSTAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In this step, new cards are filed, completed up to step 1. The method officer assesses the problem/idea to determine whether it should be applied or abandoned. In the case of abandonment, an explanation is provided. If it is to be applied, the card is moved forward to step 2.</td>
<td>In this step, the observation is tagged and assigned to a partner and an existing problem. The tagging can be done by the partner, who may volunteer, or by the author. Self-assignment is desirable. The card then moves on to step 3.</td>
<td>In this step, the author and partner work together to find the root cause of the problem or the value of the idea. Then the card moves on to step 4.</td>
<td>The partner and author now work together to find a solution for the problem or proposed idea. The suggested action is also planned and its implementation is monitored. This step ends when the action is complete and the card moves on to step 5.</td>
<td>In this step, the manager audits the action, its implementation and its execution. If the result is satisfactory, the action can be closed. Otherwise, it may remain open or be the subject of a new card.</td>
</tr>
</tbody>
</table>
Montreal (CHUM) hospital member. This deployment has been supervised by the CHUM's transformation support team and operationalized by the unit’s head nurse and team. They ask us to compare data collection (publically available over the unit) with the reference study. This department occupies the hospital’s Le Royer building first floor (Le Royer 1). It has 34 beds and is served by the head nurse and staff on three shifts:

1. day: six nurses, two auxiliary nurses and four orderlies;
2. evening: five nurses, one auxiliary nurse and two orderlies; and
3. night: three nurses, one auxiliary nurse and one orderly.

With these 25 people and one manager, the organization provides continuous care. The internal medicine unit receives people with complicated, long-lasting diseases. Patients are often elderly, and frequently require isolation. The unit has a high flow (patients, staff, students and visitors). The data stored on paper cards (Figure 3) are recorded using a spreadsheet. The continuous improvement process was implemented in two phases: the first involved adapting the method; the second was deployment.

Phase 1: adapting the method: the first phase adapted the method to this unit’s specific needs. Meetings were held with the CHUM’s transformation support department staff and the unit’s head nurse. Following these meetings, the facilitation tools were reviewed to meet the key stakeholders’ facilitation needs. An employee card is illustrated in Figure 4. The only differences from the original are the CHUM logo and shape. This change was essentially due to using a cork board rather than the table presented in Figure 2.

The process support table was adapted. Several columns were added to track how improvement actions were managed. Our partners in the deployment phase wanted to present three action stages to simplify communication with floor staff: idea generated; idea in process; and closure. This simplification was applied so a test could be carried out. The second modification concerns subdividing the three stages mentioned above.

![Employee card used in the internal medicine unit](image-url)
into subcategories. Three steps were added to the process: first, recording the implementation plan related to the action; second, the column for delayed actions; and third, the column for closed actions. These three new columns anticipate certain difficulties in managing actions (respectively, the need to create a plan for each action, anticipating delays in the plan and archiving actions). The method can be deployed flexibly and can accommodate practices as happened during the test. Despite the changes, the facilitation functioned in the same way as in the initial plan.

Phase 2: deployment: the second phase was deployment at the operational level. It was based on five actions: installing the process table; creating and applying a communication plan; creating a working team; structuring facilitation; and following-up the process table.

Installation process tables: the continuous improvement table, was installed in the middle of the unit. It was set up in an open space close to the patient beds and the meeting area so that everyone in the department could identify the table.

Communication plan: to ensure that various stakeholders collaborated and became involved in the process, a communication plan was created. Meetings with the staff in six departments and the people involved in the initiative: first, working team at Le Royer 1 (nurses, auxiliary nurses and orderlies); second, multidisciplinary team at Le Royer 1 (physicians, physiotherapists, occupational therapists, social worker, link nurses, etc.); third, Hôtel-Dieu’s infection prevention, bed management hygiene, sanitation and waste management committees; and fourth, Hôtel-Dieu’s nutrition department. The communication plan was useful when stakeholders in other departments than Le Royer 1 had to be mobilized. It was deployed before the table was installed.

Creating a working team: floor staff training did not take long. The working team was trained in 15-minute capsule sessions every shift. Sessions covered the following subjects:

- how cards work;
- how tables work; and
- how the Five Whys tool works.

Managers, head nurse and the working team all appreciated the capsule training method. The 15-minute sessions allowed the whole working team to attend without neglecting their regular activities. The training was done at the same time as the table was installed.

Structuring the facilitation: the following topics were addressed at the meetings:

- applying the process facilitation recommendations mentioned above;
• encouraging team participation in the process; and
• discussing processes and the method.

Facilitation took place with the department head; the manager who acted as project sponsor was also involved.

Following-up the process table: we supported the organization for 15 weeks following staff training and the process table was installed. This support included ongoing coaching for the head nurse and team members. The objective was to answer questions about the method, provide support when implementing solutions and verify the teams’ results. During this period, training was reinforced. Following implementation, we investigated how the method was applied and observed how staff in a busy organization accepted managing new daily improvement opportunities. The process took 15 weeks in 2013, after participants were trained. During the 15 weeks, the observations that were suggested and closed were tracked each week. The following section presents the detailed test results with comments. Each observation is coded O and each comment is coded C. A comparison to a case from the literature is also presented along with qualitative feedback from managers and participants.

Results

Total ideas suggested (operationalization): idea generation during 15 weeks is presented in Figure 3: (O) – a peak in ideas submitted is observed at the start. (C) – is considered to be normal because it was the first time participants were able to report irritants in their daily work. Thus, the method functioned as an outlet at that time.

(O) – a second peak is observed during week 12, this one for idea closure. (C) – corresponds to starting interdepartmental problem-solving activities (kaizen blitzes), which complemented this process for highly complex cards. Over 15 weeks, 21 ideas were generated. During that period, 15 were closed (71 per cent closure rate). Table I shows observations per subject. (O) – almost one quarter (24 per cent) are related to infection prevention. (C) – value highlights the subject’s importance to this patient care unit. It is coherent with staff efforts to control and prevent nosocomial infections.

Employee involvement (empowerment)

(O) – percentage suggestions per shift is presented in Table II and employees per shift is shown in Table III. These two tables reveal that the percentages of employee’s ideas per shift are similar. (C) – shows that employee participation in the programme was homogeneous. There were 0.84 suggestions per employee over 15 weeks.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Observations</th>
<th>% ideas per subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection prevention</td>
<td>5</td>
<td>23.81</td>
</tr>
<tr>
<td>Documentation</td>
<td>4</td>
<td>19.04</td>
</tr>
<tr>
<td>Equipment</td>
<td>4</td>
<td>19.04</td>
</tr>
<tr>
<td>Technology management</td>
<td>2</td>
<td>9.52</td>
</tr>
<tr>
<td>Patient safety</td>
<td>2</td>
<td>9.52</td>
</tr>
<tr>
<td>Patient care</td>
<td>2</td>
<td>9.52</td>
</tr>
<tr>
<td>Roles</td>
<td>1</td>
<td>4.76</td>
</tr>
<tr>
<td>Wait times</td>
<td>1</td>
<td>4.76</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

Table I. Classifying observations
Regarding weekly meetings, we note that work team members participated at a good rate (90 per cent). Moreover, these meetings took place every week and every shift during the project follow-up phase.

**Discussion**

Comparisons were performed using ideas per person per week and the mean time for closing actions. The approach presented by Jacobson *et al.* (2009) appears to be the closest to our programme. Their initiative was more extensive than ours; implemented in an emergency department and involved 71 professionals, or 2.84 (excluding managers) times as many people. Testing was conducted over 173 weeks, compared to 15 for us, or 11.53 times longer. Finally, they generated 408 observations/actions vs 21 for us; i.e., 19.43 times as many improvements. To compare the studies, we calculated various indicators: observations per employee; observations per week; observations reported by employees each week; and cycle time for closing actions (Table IV).

Our improvement process generated 0.84 observations per employee, whereas the reference study generated 5.74, representing 6.83 times as many suggestions per employee. However, this difference should be considered in light of the experiment’s duration, which in their case was 11.53 times longer. The time factor seems to have a proportional effect (a 0.5 factor) on total actions generated. Our proposed method generated fewer observations per week than Jacobson *et al.* (2009); i.e., 1.4 vs 2.28 ideas per week or 38.6 per cent fewer observations. This difference is substantial; however, total people involved is a

<table>
<thead>
<tr>
<th>Shift</th>
<th>Observations</th>
<th>% ideas per subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td>Evening</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Night</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Multi. team</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Physicians</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Sanitation officer</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table II.**

Ideas suggested per shift

<table>
<thead>
<tr>
<th>Shift</th>
<th>Employees</th>
<th>% employees/shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Evening</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>Night</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table III.**

Employees per shift

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Le Royer 1</th>
<th>Vanderbilt Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations per week</td>
<td>1.4</td>
<td>2.28</td>
</tr>
<tr>
<td>Observations per employee per week</td>
<td>0.056</td>
<td>0.0332</td>
</tr>
<tr>
<td>Observations per employee (mean)</td>
<td>0.84</td>
<td>5.74</td>
</tr>
<tr>
<td>Cycle time for closing actions (mean days)</td>
<td>42</td>
<td>71.5</td>
</tr>
<tr>
<td>Employees</td>
<td>25</td>
<td>71</td>
</tr>
<tr>
<td>Test duration (weeks)</td>
<td>15</td>
<td>173</td>
</tr>
</tbody>
</table>

**Table IV.**
factor. The size differential between the team involved in our process (25 employees) and Jacobson group (71 employees) is 65 per cent. We note that the total people involved in the process also seems to have a proportional effect on total actions generated, close to a factor of 0.5, which participating team size and the project duration. To compare the two methods, we measured the weekly idea/observation generation rate per person. Ours was 0.056 compared to 0.0332 for Jacobson, or 68.67 per cent higher. Our standard deviation was 0.099, while Jacobson was 0.010. It is clear that the two methods differ significantly and that the monitoring variables are guided by different behaviours. The Jacobson approach resulted in an improvement action rate that was lower but more regular and homogeneous within teams. The mean cycle time for idea closure differed by 29.5 days. Staff in the organization in which our method was implemented closed actions in approximately 42 days, while in the Jacobson study, closure occurred after a mean 71.5 days. This corresponds to a 41.26 per cent advantage over the earlier study. The explanation for this excellent performance is not obvious; it might result from a deadweight effect that decreases over time. The explanation would then be the same as for the previous point: the difference in deployment duration. A second possible explanation concerns the actions retained. It is common for continuous improvement actions to focus on fairly major projects and Jacobson et al.'s case study might have targeted larger-scale actions than ours. Nevertheless, that would need to be confirmed by a fine-grained analysis of suggested actions. It remains to be seen whether the 71.5-day vs 42-day cycle time is also influenced by the organization that is specific to the experimental site.

Our results are encouraging; they allowed comparison with an earlier case study in the literature and demonstrated good performance and an encouraging improvement rate (shorter cycle time). Nevertheless, the test’s short duration means that only preliminary conclusions can be drawn. A more in-depth comparison would necessitate obtaining more statistical data. We recommend that additional and longer investigations be carried out to systematically measure the same indicators. This project succeeded, according to ideas per person per week, in stimulating active participation by internal medicine team members at CHUM Le Royer 1 and other stakeholders in that unit. The idea authors included physicians, multidisciplinary team and sanitation officer who worked in the unit. Although the daily continuous improvement project was a pilot, no similar initiative was implemented at the CHUM as a whole and programme participants were not used to these methods, substantial ideas were efficiently closed during the project (71 per cent). This is a success factor for the programme and a good argument for continuing with the project. The problems collected using the STARS method covered several continuous improvement aspects: service quality; costs; execution speed and infection prevention. Finally, staff applying this method face certain problems:

- some suggestions were complex, given that the project was designed to handle simple problems;
- idea authors were not given much to analyse and implement solutions;
- agreeing the performance indicators for some suggestions; and
- poor participation by the multidisciplinary team in weekly meetings.

According to Bronet (2006), one kaizen principle is that it should apply within an overall framework in which participants’ individual capacities must be exploited to enhance overall performance. Nevertheless, the successes presented in the literature review and our project have only local scope: the improvement initiatives were limited to one
Transition from local to an organization-wide scope is a common problem when implementing continuous improvement methods in the healthcare sector. As Warda (2009) mentions, managers must prove that they want to invest in improvement approaches because they believe that this is an appropriate response to the organization’s mission, values and vision, which must include excellence and continuous improvement.

Conclusion

We present a continuous improvement method that encourages front-line employees to participate at the Centre Hospitalier Universitaire de Montréal. Outcomes were compared to a reference study. The STARS process is supported by two simple tools: a table and cards that instigate improvement actions. With these tools, the process and the actions to handle improvement opportunities can be applied. Our study showed encouraging results compared to the literature. The ideas per person per day was 68 per cent higher compared to the reference case study. The mean time for closing actions was about 41 per cent better (lower) than in the reference case study. Some challenges need to be overcome, especially test duration and improving the problem-solving process. The next steps will be to support the method with modern, mobile tools and to track the method’s impact in real time. There are also plans to expand the scope and base performance on substantial statistical data. Finally, behavioural pragmatics must be analysed to understand why the results are different performance compared to past studies. This work is now under way at the Polytechnique Montreal’s CIMAR-LAB.

References


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