Improving the Procurement Challenges & Insights

Prof. Tariq A. Aldowaisan
Founder & General Manager
Global Lead Consultants, Industrial, Management & Training

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Bio

- Bachelor, Master, & Ph.D. from Arizona State University, USA in 1990
- Professor of Industrial & Management Systems Engineering, Kuwait University from 1991 to 2017
- Founder & GM of Global Lead Consultants (GLC) since 2005
- Quality Certifications: ASQ CMQ/OE, CSSBB, CQE, CQA, & CSQP
- Safety Certifications: BCSP ASP, CSP, & CET
- Consult, train, write, and speak on quality, organizational excellence, performance measurement, strategic planning, and safety
The Procurement Process
The Two Strategies for Process Improvement
The Quality of the Procurement Process
The Sigma of the Procurement Process
Challenges & Insights to Improve the Procurement Process
So, how good is your procurement?

- High inventory cost
- Delayed shipments
- Delayed RFQs
- Low performing vendors & contractors
- Users not satisfied
- Suppliers not satisfied
The answer boils down to …

• How accurate is your procurement process?
• How consistent is your procurement process?
The Process Performance

RFQ Process

A1 → A2 → A3 → A4 → A5

Output/Performance

38 Days Late

User

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The Two Process Improvement Strategies

- waste reduction
- Variation reduction

It all starts with defining the Standard

• A standard consists of:
  
  o Target value

  o Failure limit(s)

  • What do we call the “38 days”?  
  
  **A failure limit**
1. The specs on the length of the copper pipe is 100 ± 2 cm.

2. Contractors should be paid no later than 30 days from the time of a correct invoice receipt.

3. User satisfaction should be 80% or more.
Pipe Length

The specs on the length of the copper pipe is 100±2 cm.

• The target value is 100 cm
• The success limits are 98 and 102 cm
• The standard is 100±2 cm
Contractors should be paid no later than 30 days from the time of a correct invoice receipt.

- The target value is 22 days
- The success limit is 30 days
- The standard is 22 + 8 days
User Satisfaction

• User satisfaction should be 80% or more.

• The target value is 90 %

• The success limit is 80 %

• The standard is 90 - 10%
Measuring Performance

- accuracy is how close is your performance value to the target value
- consistency is how close are your performance values to each other.

Which is the better company KOH or KPH?
The average is the measure of accuracy ... Accuracy improves, as the average gets closer to the target value.

Which is more accurate: KOH or KPH?
The sigma is the measure of consistency ... consistency improves, as the sigma gets closer to zero.

Which is more consistent: KOH or KPH?
Ex 1: Calculate Average & Sigma

<table>
<thead>
<tr>
<th>KPH</th>
<th>29</th>
<th>28</th>
<th>28</th>
<th>28</th>
<th>27</th>
<th>29</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOH</td>
<td>26</td>
<td>25</td>
<td>25</td>
<td>24</td>
<td>23</td>
<td>27</td>
</tr>
</tbody>
</table>

![Diagram showing Invoice Payment](image-url)
Measures of Centrality

The sample average ($\bar{x}$) is

a. the middle value in an ordered data. For even data set, it is the average of the two middle values. **median**

b. the maximum value in a data set.

c. the most widely used measure for central tendency. It is the arithmetic average. It is the sum of all data values divided by the number of data points. It is an estimate of the population mean $\mu$.

d. the most frequently occurring number in the data set. A data set may have more than one mode. **mode**
Measures of Consistency

The sample sigma (standard deviation SD) is

a. the difference between the largest and smallest values in a data set. **Range (R)**

b. the most widely used measure for analyzing dispersion. It measures the average deviations from the mean. It estimates the population standard deviation \( \sigma \).

c. the standard deviation squared. **Sample Variance \( s^2 \)**

d. the standard deviation divided by the mean expressed as a percentage. **Coefficient of variation \( CV \)**
• inconsistency is the enemy one of quality performance

• human is the main source of inconsistency

• Therefore, human is enemy one of quality 🙂
• Be more **accurate** ... that is get your average close to target value

• Be more **consistent** ... that is get your sigma close zero
• Old thinking ... as long as you are in the success region, all is the same.

• New thinking ... it is not enough to be in the success region, your aim is the target value.
To distinguish excellent from mediocre performances, you need to define levels within the success region.
Types of Measures of a Process

**Vision & Strategic Objectives**

- **Effectiveness**
  - Efficiency
  - Productivity
  - Output
  - Process
  - Inputs (Resources)

**Effect**

- Impact
- Quality
- Customer

**Output quality = User satisfaction**

**Actual/Planned**

\[
\frac{Actual}{Planned} = \frac{\text{inventory cost actual}}{\text{inventory cost planned}}
\]

- **Output**
  - \[\frac{Output}{Input} = \frac{orders}{purchaser}\]
- **Efficiency**
  - \[\frac{Input}{Output} = \frac{\text{Cost}}{order}\]
  - \[\frac{Input}{Output} = \frac{\text{time}}{order}\]
- **Quality**
  - \[\frac{Output}{Output} = \frac{\text{User satisfaction}}{order}\]
- **Customer**
  - \[\frac{Input}{Output} = \frac{\text{time}}{order}\]
Process Sigma

RFQ Request → A1 → A2 → A3 → A4 → A5 → Fulfil

Process Cycle Time

38 Days late

consistency

Good process ... 27 defects per 10,000 (3 Sigma)

Excellent process ... 3.4 defects per 1,000,000 (6 Sigma lenient)

Ideal process ... 2 defects per 1,000,000,000 (6 Sigma strict)
Lean & Six Sigma

Flowchart
- SIPOC
- Run chart
- Dot chart
- Numerical measures
- Check sheet

Measure
- Scatter diagram
- Correlation analysis
- Fishbone diagram
- Histogram
- Flowchart
- Pareto analysis

Analyze
- Integrated analysis questions
- Distributions
- Design of analysis
- Brainstorming
- Root cause analysis

Control
- Audit
- Control charts

Improve
- Coaching and training
- Flowchart
- CBA
- SOP
- Hypothesis testing
- Kepner-Tregoe

Define
Case Example: Invoice Payment

- The standard of invoice payment is 22 + 8 days
- The analyst wanted to check the times of the last 10 invoices.

23  33
26  26
25  29
22  27
26  20
The analyst drew the dot diagram.
Case Example: Average & Accuracy

- The mean ($\bar{x}$) = 25.7 days
- Show the mean on the dot diagram
- Accuracy = |Mean – Target| = |25.7 - 22| = 3.7 days
- Mode = 26 days
- Median = 26 days

\[
\bar{x} = \frac{\sum x}{n}
\]
Case Example: Sigma & Consistency

- The SD ($S$) = 3.7 days
- Show the SD on the dot diagram.
- Consistency = SD = 3.7 days
- $S^2$ = 13.3 days
- $R$ = 13 days
- CV = 14%

\[ S = \sqrt{\frac{\sum(X-\bar{x})^2}{n-1}} \]
Case Example: Sigma Performance

• In our example, the sigma of our process is less than 1.5
Sigma Performances

- In SS, the *process sigma level* is calculated for ideal (i.e. no shift) and Motorola (i.e. 1.5σ shift allowance) methods.

- Motorola approximation:
  
  \[
  \text{Sigma Level} = 0.8406 + \sqrt{29.37 - 2.221 \times \ln(ppm)}
  \]

- What is the sigma level of a process with a yield of 99.9930%?

  \[
  \text{P(defect)} = 70 \text{ ppm}
  \]

  \[
  = \text{Sigma Level} = 5.3 \text{ Sigma}
  \]
Case Example: Process Performance

- Assume a six sigma team studied the process of invoice payment over a 4-month period. They were able to improve it through eliminating waste and training.
- This lead to reducing the sigma to half and shift average by about one day.
Process Sigma … Minitab
Happy to share copies of our published work on Six Sigma:


نتمنى مُشاركتكم
لم يكمل تحسين ما لا يكمن قياسه – بيتر دي إكر

أ. د. طارق عبدالمحسن الدويسيان

للمُهتمين...

لا شك أن الأدلة النهائية أهمية ضرورية، فهي تعكس بشكل مُباشر، ومحاسن "صحح" الوضع التنموي للمملكة، وهي تحمل بصيغة عالية، لذلك يجب على المسؤولين في دول الكويت قراءة نتائج الأدلة التي تتيحهم قراءة التحول التدريجي للوضع البديع، ورؤية الأفكار البديعة عن الشحنات، وتعزيز القصور في مجالات مثل السياسة أو التنافسية أو التنمية البشرية، ومن دون فعالية جزء سيكون عواقباً وخيمة. خاصة في الوقت الحالي الذي تسعى فيه الكويت إلى توسيع استدامة والتحول عن الشموع على مصدر دخل واحد إلى النمو.

وبناءً على ذلك، وبناءً على ذلك، والذين نتأتى بهم إلى الفكرة، هناك الكثير من الكتب، لا يصلحون دون المطلوب الأحكام على المشاركة في جميع الأدلة يؤثر في بيئة скачقة في الإصلاح، هذه الرغبة تناسب في المشاكل المُستخدمة في البيئة الحالية والتربوية والبحثية التي دُرت، بالإضافة إلى استدامة الهيئات الرقابية كتقنية العامة للсадة، ووجهاء المرافقين الماليين.

عُبر أداء الكويت في أهم الأدلة العالمية للتنمية

يتناول كتاب "الكراتنة في الكويت 2018" مواضيع تنمية مختلفة من منهجية الأدلة الدولية لخيرية. لذا ما الأحكام التي تجدر بهم التقدم بها في كتاب، أو أي كتاب آخر المتوفر في الجزء التنفيذي الذي يعمق علمه. كما يمكن للقارئ الباحث أن ينفعه أي من أهمية التأسيس التي تؤدي إلى الكتاب. يمكن تحصين أن تؤدي هذا المنهج السابق في دعم جهود التنمية في بلدنا الغالي (الكويت).
Thank you