Using Technology to Enhance the Quality of, and Prevention of Corruption in Ghana

Michael Larson

Sales Director, BM Autoteknik, Denmark
BM Autoteknik A/S

- Family owned company, founded in June 1977.
- 50 employees in Denmark, England and Germany. Member of CITA.
- In-house R&D, Manufacturing, Sales and After Sales Support.
- Largest manufacture of Test line systems in North Europe.
- Export to 30 countries Worldwide.
- Supplied more than 10.000 systems.
1. Practical examples of fraud and corruption.
2. The Benefit of using advanced IT systems in PTI
3. A quick introduction to BM’s IT system; BM FlexCheck.
4. Define the fraud fighting strategy via “Setting the scene”.
5. Examples of practical fraud fighting via PTI IT system.
Corruption in Denmark?
Case 1 – Busted

- One PTI inspector passed 85 vehicle by just filling out the inspection report manually, without conducting any sort of inspection.
Almost 1 in 5 inspection companies obtain the lowest rating "C".

Vice Chairman of the Danish Counsel for Higher Road Safety, Mr. Mogens Wilbert said:

“There are examples of agreements made between those who bring the vehicles to the PTI station and the PTI operators.

If a Used Car Dealer delivers 10 vehicles per month, then the PTI station will off course offer a “special good” service to such a customer……”
Case 3 – The Danish PTI Industries view

Jesper Bech Ebeltoft vehicle inspection:

“We know several cases, where vehicles with serious defects have been passed by a competitor. Clearly this documents, that some PTI stations are cheating and deceiving”.

- The PTI industry requests more secret checks and audits to be done by the authorities (ghost inspections).
National TV station program "Operation X" goes under cover:

- PTI operators can make up to DKK 20.000 (Euro 2.500) per month on such scam.
- Also Car Dealers makes a lot of money from using corruption to ensuring PASS on vehicles with serious defects.”
Is there Corruption in Denmark?

Within PTI: "YES" – and it’s probably a global problem.

Issues documented:
1. Traditional corruption between Driver and Operator.
2. Fraud without corruption involved.
3. A high financial incentive drives corruption.
4. The PTI industry itself, requires better enforcement by the Authorities to ensure "fair play".
The Benefit of using advanced IT systems in PTI

**Commercial and QA benefits:**
- Reduced PTI inspection time, increasing throughput and turnover.
- More consistent PTI procedures – no manual input of test data.
- Reduction of the training period for new staff.
- Faster adaption of PTI to legislation changes, and new vehicle types.

**Fraud and Corruption fight benefits:**
- Prevention
- Detection
A Quick introduction to BM FlexCheck
PDA based – WiFi - Bluetooth

- Handheld units (PDA or Windows Phones)
A quick introduction to BM FlexCheck

PDA based – WiFi - Bluetooth

1. Traditional single PTI lane (Not shared)

2. Multi PTI Lane application - sharing.

3. Nationwide structure.

Booking web site

BM FlexCheck National

Authority database
Prevention and Detection of fraud and corruption – Defining the scenes

Scene 1: Vehicle owner cheats by himself
  • Temporary fittings of good parts.
  • Tampering with the vehicles emission and safety systems.
  • The fraud fighting benefit of a local PTI IT system is limited.

Scene 2: Vehicle owner and PTI operator cheats via corruption
  • A local PTI IT system can significantly improve prevention and detection.

Scene 3: Vehicle owner, PTI operator and Manager/owner cheats via corruption
  • The fraud fighting benefit of a local PTI IT system is very limited.
Scene 2: **Prevention** - Vehicle owner and PTI operator cheats

**Actions:**

1. Break the linkages between the two parties via "smart solutions"

2. Test data from all electronic equipment is collected automatically.


4. Test results during PTI procedure are (partially) hidden from PTI staff.

5. Prevent PTI staff from editing the PTI test results.

6. **Automatic photographing of vehicle that is stored with PTI test results.**

7. CCTV surveillance (with live inspection data).

Add 5: **Re-entry of User ID and Password, if any changes to already stored date is done or any other data manual entry is required.**
Example of securing payment

- Payment security system.
Example of breaking the linkage between Client and PTI staff

- Vehicle Key management system.
Scene 2: Prevention - Vehicle owner and PTI operator cheats

Actions:
1. Break the linkages between the two parties via ”smart solutions”
2. Test data from all electronic equipment is collected automatically.
4. Test results during PTI procedure are (partially) hidden from PTI staff.
5. Prevent PTI staff from editing the PTI test results.
6. Automatic photographing of vehicle that is stored with PTI test results.
7. CCTV surveillance (with live inspection data).

Add 5: Re-entry of User ID and Password, if any changes to already stored date is done or any other data manual entry is required.
Photo of Vehicle as part of PTI

- Photo taken automatically when the brake test result is saved.
- This ensures that the photo is linked to the actual brake test.
- This concept prevents corruption and fraud.
Scene 2: Prevention - Vehicle owner and PTI operator cheats

Actions:

1. **Break the linkages between the two parties via ”smart solutions”**

2. Test data from all electronic equipment is collected automatically.


4. Test results during PTI procedure are (partially) hidden from PTI staff.

5. Prevent PTI staff from editing the PTI test results.

6. **Automatic photographing of vehicle that is stored with PTI test results.**

7. CCTV surveillance (with live inspection data).

*Add 5: Re-entry of User ID and Password, if any changes to already stored date is done or any other data manual entry is required.*
Scene 2: **Detection** - Vehicle owner and PTI operator cheats

Make statistics of PTI test result database to establish:

**Who did what when?**

**Data mining example:**
- A given period of time (for example 3 months)
- Define the vehicles to be considered (e.g. 1st registration between 2000 and 2002)

1. Comparison of Pass rate between the PTI operators
   - Compare development of these Pass Rates between 2 or more periods.

2. Comparison of the Number of Visual Inspection (VI) points registered between different PTI inspectors
   - Compare development of these numbers between 2 or more periods.

3. Comparison of Average time taken to conduct a PTI between different PTI inspectors.
   - Compare development of these numbers between 2 or more periods.
**Pass Rate**

<table>
<thead>
<tr>
<th>Operator Name</th>
<th>Fall Dangerous</th>
<th>Fall Reject</th>
<th>Pass</th>
<th>Pass Advice</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Capone</td>
<td>27.24%</td>
<td>25.55%</td>
<td>25.55%</td>
<td>25.55%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Al Capone</td>
<td>25.55%</td>
<td>24.96%</td>
<td>23.89%</td>
<td>29.67%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Al Capone</td>
<td>25.48%</td>
<td>24.43%</td>
<td>27.24%</td>
<td>22.95%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Al Capone</td>
<td>25.38%</td>
<td>29.75%</td>
<td>23.54%</td>
<td>23.54%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Bill Gates</td>
<td>45.91%</td>
<td>25.25%</td>
<td>25.25%</td>
<td>25.25%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Charlie Lindbergh</td>
<td>24.86%</td>
<td>25.21%</td>
<td>23.87%</td>
<td>29.52%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Charlie Lindbergh</td>
<td>24.68%</td>
<td>24.75%</td>
<td>25.71%</td>
<td>25.65%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Charlie Lindbergh</td>
<td>24.38%</td>
<td>23.75%</td>
<td>25.71%</td>
<td>25.65%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Eddie Murphy</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Elvis Presley</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Elvis Presley</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Elvis Presley</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Elvis Presley</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Elvis Presley</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Elvis Presley</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Elvis Presley</td>
<td>24.86%</td>
<td>25.23%</td>
<td>24.88%</td>
<td>24.88%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

**Statistics:**

- **Pass Rate:** 24.86%
- **Pass Rate:** 45.91%
- **Fail Rate:** 75.14%
Scene 2: Detection - Vehicle owner and PTI operator cheats

Make statistics of PTI test result database to establish:

**Who did what when?**

**Data mining example:**
- A given period of time (for example 3 months)
- Define the vehicles to be considered (e.g. 1st registration between 2000 and 2002)

1. Comparison of Pass rate between the PTI operators
   - Compare development of these Pass Rates between 2 or more periods.

2. Comparison of the Number of Visual Inspection (VI) points registered between different PTI inspectors
   - Compare development of these numbers between 2 or more periods.

3. Comparison of Average time taken to conduct a PTI between different PTI inspectors.
   - Compare development of these numbers between 2 or more periods.
<table>
<thead>
<tr>
<th>Operator Name</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Capone</td>
<td>14.70%</td>
<td>14.91%</td>
<td>13.59%</td>
<td>14.02%</td>
<td>12.90%</td>
<td>14.02%</td>
<td>14.88%</td>
</tr>
<tr>
<td>Albert Brown</td>
<td>13.32%</td>
<td>14.06%</td>
<td>13.94%</td>
<td>14.06%</td>
<td>13.94%</td>
<td>15.68%</td>
<td>13.65%</td>
</tr>
<tr>
<td>Avela Franklin</td>
<td>14.37%</td>
<td>11.31%</td>
<td>13.98%</td>
<td>12.96%</td>
<td>15.78%</td>
<td>13.93%</td>
<td>16.11%</td>
</tr>
<tr>
<td>Bake Rush</td>
<td>14.95%</td>
<td>13.27%</td>
<td>13.77%</td>
<td>14.49%</td>
<td>13.72%</td>
<td>13.72%</td>
<td>14.90%</td>
</tr>
<tr>
<td>Bill Gates</td>
<td>15.05%</td>
<td>13.76%</td>
<td>13.76%</td>
<td>14.11%</td>
<td>13.95%</td>
<td>14.84%</td>
<td>14.70%</td>
</tr>
<tr>
<td>Charlie Lindberg</td>
<td>15.03%</td>
<td>13.88%</td>
<td>14.94%</td>
<td>14.37%</td>
<td>14.25%</td>
<td>13.74%</td>
<td>13.80%</td>
</tr>
<tr>
<td>Charlie Chaplin</td>
<td>15.57%</td>
<td>13.45%</td>
<td>13.82%</td>
<td>14.74%</td>
<td>15.21%</td>
<td>14.58%</td>
<td>14.76%</td>
</tr>
<tr>
<td>Eddie Murphy</td>
<td>14.12%</td>
<td>14.86%</td>
<td>14.52%</td>
<td>14.00%</td>
<td>13.66%</td>
<td>14.00%</td>
<td>13.22%</td>
</tr>
<tr>
<td>Elvis Aron Presley</td>
<td>14.22%</td>
<td>14.80%</td>
<td>14.66%</td>
<td>14.17%</td>
<td>14.60%</td>
<td>13.97%</td>
<td>13.64%</td>
</tr>
<tr>
<td>Jon Hendle</td>
<td>15.55%</td>
<td>13.46%</td>
<td>13.08%</td>
<td>12.71%</td>
<td>12.55%</td>
<td>10.56%</td>
<td>12.30%</td>
</tr>
<tr>
<td>John Belushi</td>
<td>13.55%</td>
<td>13.58%</td>
<td>15.00%</td>
<td>14.91%</td>
<td>14.85%</td>
<td>14.22%</td>
<td>13.61%</td>
</tr>
<tr>
<td>Mahanana Gandhi</td>
<td>14.46%</td>
<td>16.24%</td>
<td>13.39%</td>
<td>12.49%</td>
<td>14.22%</td>
<td>14.79%</td>
<td>13.79%</td>
</tr>
<tr>
<td>Mark Twain</td>
<td>14.83%</td>
<td>14.52%</td>
<td>14.24%</td>
<td>13.44%</td>
<td>13.24%</td>
<td>13.09%</td>
<td>13.49%</td>
</tr>
<tr>
<td>Michael Jackson</td>
<td>13.90%</td>
<td>15.07%</td>
<td>13.98%</td>
<td>13.96%</td>
<td>13.72%</td>
<td>13.72%</td>
<td>13.77%</td>
</tr>
<tr>
<td>Ray Ottes</td>
<td>12.66%</td>
<td>13.49%</td>
<td>12.44%</td>
<td>14.23%</td>
<td>13.25%</td>
<td>15.67%</td>
<td>14.01%</td>
</tr>
<tr>
<td>Rose Parks</td>
<td>15.64%</td>
<td>14.38%</td>
<td>13.93%</td>
<td>13.93%</td>
<td>12.89%</td>
<td>14.03%</td>
<td>14.90%</td>
</tr>
<tr>
<td>Tom Hanks</td>
<td>14.19%</td>
<td>14.63%</td>
<td>13.88%</td>
<td>12.94%</td>
<td>14.19%</td>
<td>16.48%</td>
<td>14.63%</td>
</tr>
</tbody>
</table>

VI Fault Rate

- 15.05%
- 23.72%
Scene 2: Detection - Vehicle owner and PTI operator cheats

Make statistics of PTI test result database to establish:

**Who did what when?**

Data mining example:
- A given period of time (for example 3 months)
- Define the vehicles to be considered (e.g. 1\textsuperscript{st} registration between 2000 and 2002)

1. Comparison of Pass rate between the PTI operators
   - Compare development of these Pass Rates between 2 or more periods.

2. Comparison of the Number of Visual Inspection (VI) points registered between different PTI inspectors
   - Compare development of these numbers between 2 or more periods.

3. Comparison of Average time taken to conduct a PTI between different PTI inspectors.
   - Compare development of these numbers between 2 or more periods.
### Visual Inspection time

<table>
<thead>
<tr>
<th>Operator Name &amp; Age</th>
<th>Inspection (% of Ref)</th>
<th>Visual Test Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Capone 18.82%</td>
<td>48.32%</td>
<td>35.96%</td>
</tr>
<tr>
<td>Albert Einstein 18.18%</td>
<td>48.48%</td>
<td>33.36%</td>
</tr>
<tr>
<td>Aneta Franklin 17.72%</td>
<td>47.90%</td>
<td>34.40%</td>
</tr>
<tr>
<td>Babe Ruth 19.98%</td>
<td>47.66%</td>
<td>32.95%</td>
</tr>
<tr>
<td>Bill Gates 16.52%</td>
<td>48.13%</td>
<td>35.31%</td>
</tr>
<tr>
<td>Charles Lindbergh 17.92%</td>
<td>47.85%</td>
<td>36.23%</td>
</tr>
<tr>
<td>Charlie Chaplin 18.67%</td>
<td>47.05%</td>
<td>54.00%</td>
</tr>
<tr>
<td>Eddie Murphy 17.96%</td>
<td>45.96%</td>
<td>36.00%</td>
</tr>
<tr>
<td>Elvis Aaron Presley 16.68%</td>
<td>49.12%</td>
<td>34.19%</td>
</tr>
<tr>
<td>Joss Hendrix 17.54%</td>
<td>50.17%</td>
<td>32.18%</td>
</tr>
<tr>
<td>John Bellushi 18.44%</td>
<td>47.34%</td>
<td>54.36%</td>
</tr>
<tr>
<td>Mahatma Gandhi 18.08%</td>
<td>48.17%</td>
<td>32.18%</td>
</tr>
<tr>
<td>Mark Twain 18.97%</td>
<td>48.95%</td>
<td>34.09%</td>
</tr>
<tr>
<td>Michael Jackson 18.31%</td>
<td>47.50%</td>
<td>33.51%</td>
</tr>
<tr>
<td>Ray Charles 17.92%</td>
<td>47.46%</td>
<td>33.95%</td>
</tr>
<tr>
<td>Rosa Parks 19.43%</td>
<td>45.50%</td>
<td>35.07%</td>
</tr>
<tr>
<td>Tom Hankes 12.30%</td>
<td>47.52%</td>
<td>53.51%</td>
</tr>
</tbody>
</table>

**Grand Total:**

- 16.52%
- 30.47%
Scene 2: Prevention/Detection - Vehicle owner and PTI operator cheats

What else can be done:

1. Staff organizing of PTI production area:
   - It is preferable to break down inspection in "stages".
   - Job rotate staff between stages and lanes.

2. Whistleblower system
   - Create an anonymous whistleblower system for staff to owner.

3. Salary
   - Be aware of hidden income regime, when introducing IT system as measure against fraud and corruption.
Break down of PTI lane into stages
What else can be done:

1. Staff organizing of PTI production area:
   - **It is preferable to break down inspection in "stages".**
   - Job rotate staff between stages and lanes.

2. Whistleblower system
   - Create an anonymous whistleblower system for staff to owner.

3. Salary
   - Be aware of hidden income regime, when introducing IT system as measure against fraud and corruption.
The Authorities role

The Authority is a key player

• Implement approval procedures for IT systems.

• Benchmark PTI stations via data mining.

• Conduct unannounced Audits (Ghost audits).

• Create an anonymous whistleblower system for the industry.
Thank you

Photos from Elie Company Ltd - Periodic Technical Inspection in Ghana