Transforming an Audit into a KPI Tool to Promote Continuous Process and Project Improvements

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About Khatib & Alami and Myself

Early adoption of advanced technologies is part of K&A's DNA

ENR: Khatib & Alami (K&A) is among the top 50 international design firms and the top 10 in the Middle East

Today, K&A is one of the leading GIS services and utility solutions providers in the Middle East, Gulf and North Africa

K&A was the first Esri Platinum Partner in the MENA region

"Hi!"

Senior Business Planning and Performance Analyst
- Business Operations Unit in the Geospatial Systems Integration (GSI) Department

MBA graduate with 10+ years of international experience in Business Planning, Strategic Management, Process Management & Improvement, and Marketing & Advertising.

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AUDIT KPI
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Defining our Quality Assurance Process

The Quality Assurance Process covers process and product audits at the project and organizational level.
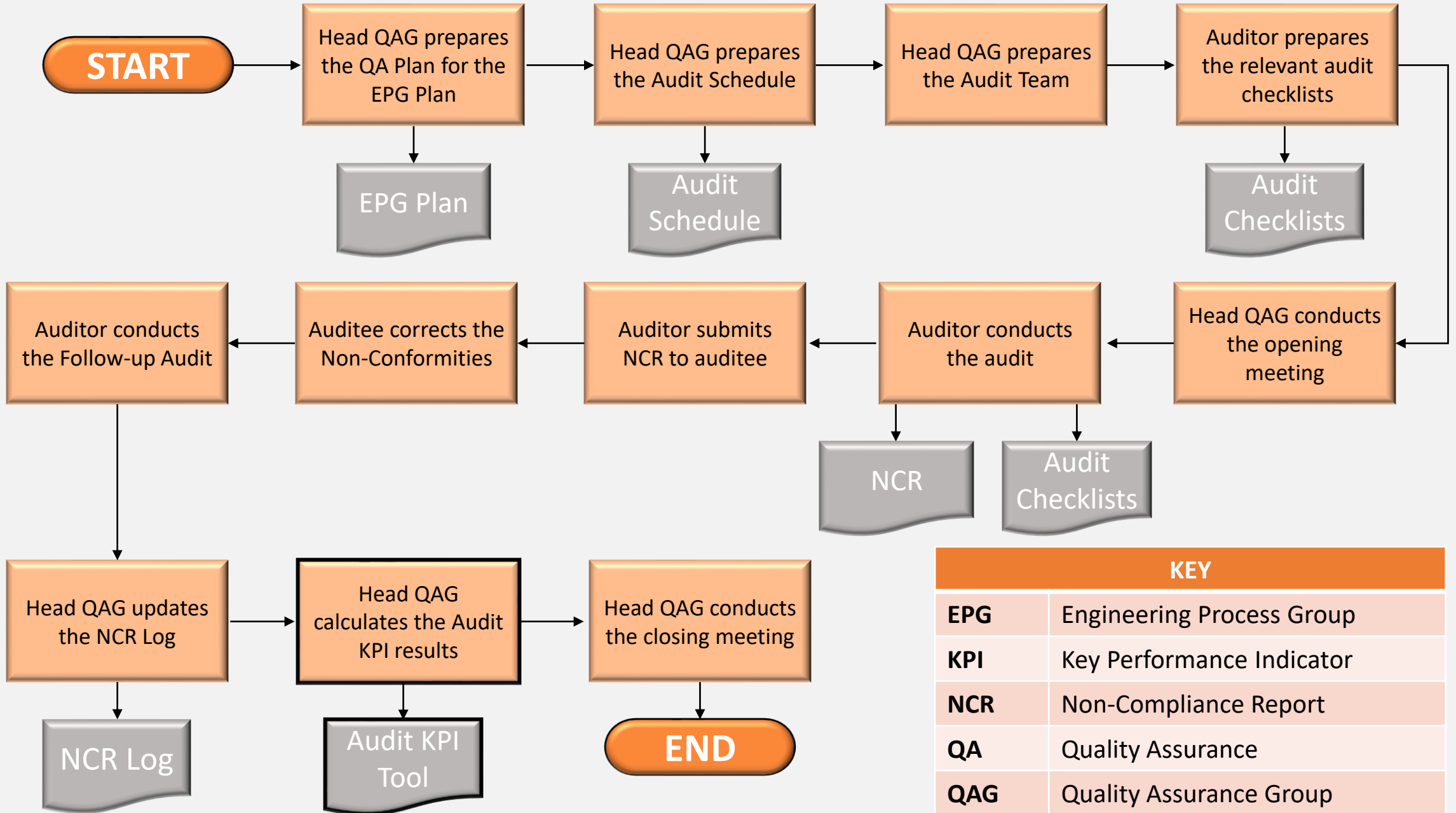
The objectives of the Internal Process audit are to:

- Establish Compliance to the defined processes
- Determine ways to improve effectiveness of the deployed processes

The feedback given by the auditing process provides a self-correcting mechanism to improve the G-QMS.

Now we will walk you through it!

Sidebar labels: ABOUT | PROCESS AUDITS | AUDIT KPI TOOL | THE IMPACT | CONCLUSION

Flowchart:

START → Head QAG prepares the QA Plan for the EPG Plan → Head QAG prepares the Audit Schedule → Head QAG prepares the Audit Team → Auditor prepares the relevant audit checklists

- Head QAG prepares the QA Plan for the EPG Plan → EPG Plan
- Head QAG prepares the Audit Schedule → Audit Schedule
- Auditor prepares the relevant audit checklists → Audit Checklists

Auditor conducts the Follow-up Audit ← Auditee corrects the Non-Conformities ← Auditor submits NCR to auditee ← Auditor conducts the audit ← Head QAG conducts the opening meeting

- Auditor submits NCR to auditee → NCR
- Auditor conducts the audit → Audit Checklists

Auditor conducts the Follow-up Audit → Head QAG updates the NCR Log → Head QAG calculates the Audit KPI results → Head QAG conducts the closing meeting → END

- Head QAG updates the NCR Log → NCR Log
- Head QAG calculates the Audit KPI results → Audit KPI Tool

KEY	
EPG	Engineering Process Group
KPI	Key Performance Indicator
NCR	Non-Compliance Report
QA	Quality Assurance
QAG	Quality Assurance Group

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The day the Audit KPI Tool was brought to life

Purpose

- Conceived and implemented in Q2-2016 (upgraded in Q4-2017)

- To reduce the high average of NCs per process audit

- Encourage proactive measures to improve and maintain our QMS

Objectives

Impact on the Clientele – Increase client satisfaction

Impact on Quality – Reduce the number of all types of defects

Impact on Performance – Improve a project team's teamwork

Impact on Productivity – Link a team member's metrics with their project's metrics

Impact on the Bottom Line – Expand a project's profit margin

Knowing how to use the Audit KPI Tool

									Evaluation						Evaluation	
Audit Ref.	Project	Audit Scope	Project Manager	Maj. NCs	Min. NCs	Resolved NCs	% Resolved	Previous Audit Pending NCs	Critical PMGT NCs closed?	Current Audit Closed on Time?	Previous Audit Closed on Time?	# of PIs	# of Positive Obs.	Ratio	KPI Result
2019-Q1	Project A	G-QMS	PM 1	2	2	1	25%	2		No	No	6	0	1.31	Fail
2019-Q1	Project B	Start-up	PM 2	2	4	6	100%		Yes	Yes		0	0	3.00	Pass
2019-Q1	Project C	Requirements	PM 3	8	8	12	75%	4	No	No	No	1	1	1.04	Fail
2019-Q1	Project D	Application	PM 4	5	13	9	50%	0	Yes	No	Yes	2	1	1.22	Pass
2019-Q1	Project E	Project Closure	PM 5	10	4	6	43%	0	No	No	Yes	4	0	1.36	Fail
2019-Q1	Project F	Configuration	PM 6	4	7	8	73%	15	Yes	No	No	2	1	0.71	Fail

$$\text{Evaluation Ratio} = \frac{[\text{Organizational Standard} + 2 + 5 + 2 * \text{Number of PIs} + 2 * \text{Number of Positive Observations}]}{[\text{Total Major NCs} + \dfrac{\text{Total Minor NCs}}{2} + 2 * \text{Open NCs from current audit} + 2 * \text{Open NCs from previous audit}]}$$

For G-QMS Audits: Organizational Standard = 5

For Start-up Audits: Organizational Standard = 10

For all other Audits: Organizational Standard = 25

Passing Criteria

At least 50% of current NCs have been resolved

No unresolved NCs related to critical PMGT items

Evaluation Ratio ≥ 1.00

KEY	
G-QMS	GSI – Quality Management System
KPI	Key Performance Indicator
NC	Non-Compliance
PI	Process Improvement
PM	Project Manager
PMGT	Project Management

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The Impact – First a Situational Analysis

- Total of 61 projects underwent process audits from 2015-Q2 to 2018-Q4

- 14 projects were selected for the Situational Analysis and split into the following:
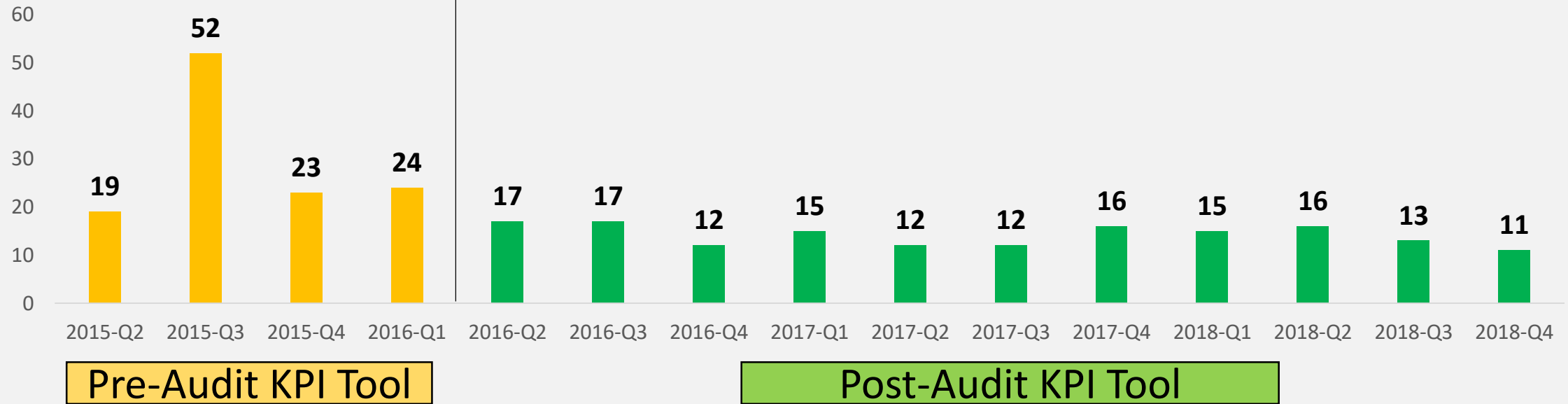
Pre-Audit KPI Tool

- Six projects satisfied the following criteria:

    1. Life-cycle must be Full-Development

    2. Must have done at least 50% of the audits between 2015-Q2 and 2016-Q1

    3. Must have done at least 25% of the audits between 2016-Q2 and 2018-Q4

    4. Must have implemented the Waterfall Methodology

Post-Audit KPI Tool

- Eight projects satisfied the following criteria:

    1. Life-cycle must be Full-Development

    2. Must have done at least 50% of the audits between 2016-Q2 and 2018-Q4

    3. Must have implemented the Waterfall Methodology

The Impact on Non-Compliances and Profitability
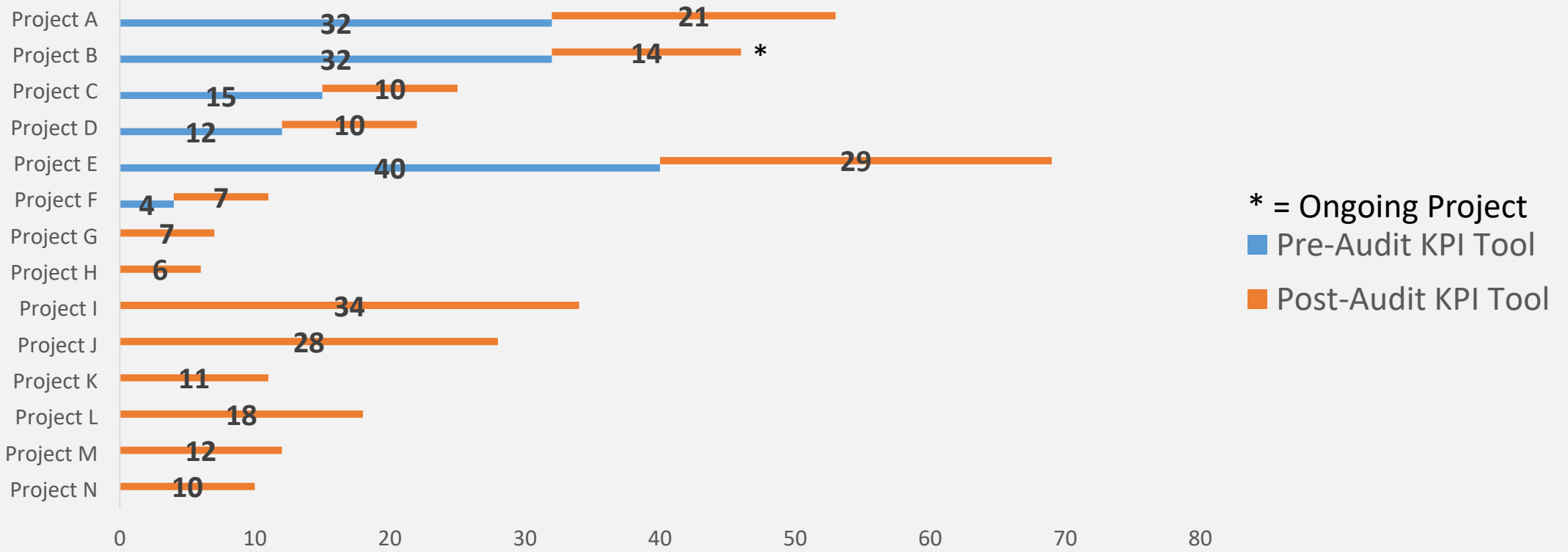
Chart — Non-Compliances per project (Pre-Audit KPI Tool in blue, Post-Audit KPI Tool in orange):

Project	Pre-Audit KPI Tool	Post-Audit KPI Tool
Project A	32	21
Project B	32	14 *
Project C	15	10
Project D	12	10
Project E	40	29
Project F	4	7
Project G		7
Project H		6
Project I		34
Project J		28
Project K		11
Project L		18
Project M		12
Project N		10

* = Ongoing Project
Pre-Audit KPI Tool
Post-Audit KPI Tool

- 64% of the projects made a profit with an average of 11 NCs per project per quarter

- 36% of the projects made a loss with an average of 27 NCs per project per quarter

- Projects A and E incurred a loss while projects B, C, D, and F made a profit

- Projects G, H, K, M, and N made a profit and projects I, J, and L

Impacted KPIs	Pre-Audit KPI Tool	Post-Audit KPI Tool
% of Projects that made a Profit	50%	66%

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An increase in Process Improvements

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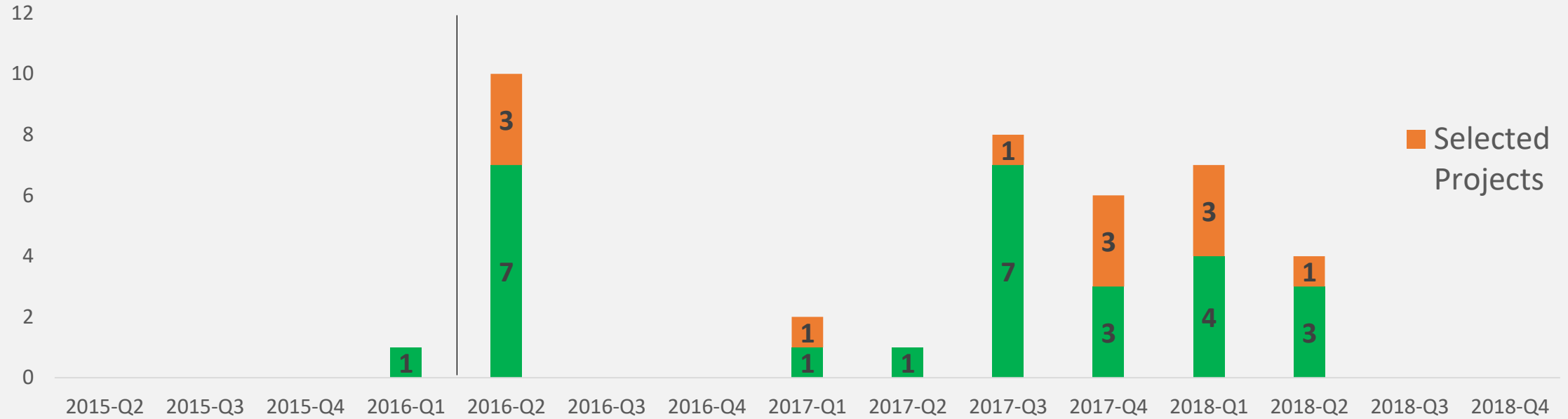
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Impacted KPIs	Pre-Audit KPI Tool	Post-Audit KPI Tool
Avg. number of valid PIs per quarter	0	1

Increase in the passing rate and reducing bugs
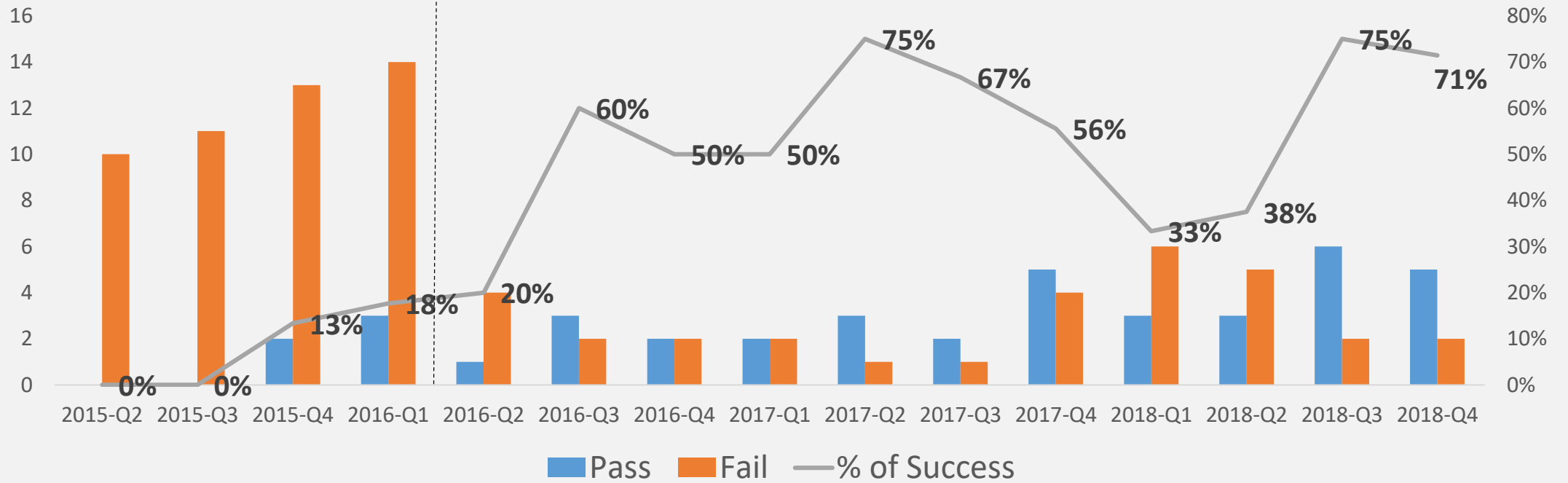
Impacted KPIs	Pre-Audit KPI Tool	Post-Audit KPI Tool
KPI Status: Avg. % of audits that passed	22%	55%
Avg. number of bugs per project	68	26

Conclusion – Bringing it all together

Impacted KPIs	Pre-Audit KPI Tool	Post-Audit KPI Tool	
Average number of NCs per project per quarter	25	15	↓
Percentage of audits with on-time fully resolved NCs	6%	28%	↑
Percentage of Projects that made a Profit	50%	66%	↑
Average number of valid PIs per quarter	0	1	↑
KPI Status: Average percentage of audits that passed	22%	55%	↑
Average number of bugs per project	68	26	↓

Conclusion – Lessons Learned and Beyond...

What went wrong:

- Resistance to Change and new staff need time to adjust to our QMS

- Lack of Automation

- Data integrity

What went right:

- Results from the Audit KPI Tool are factored in an employee's annual evaluation

- The Audit KPI Tool became a gateway to push for CMMI Level 4 and Level 5

- Sense of ownership within project teams have increased

Future Developments:

- Automate the Auditing Process and the Audit KPI Tool

- Develop a Generic KPI Dashboard to include Audit Results:

  - Submitting deliverables on time e.g. actual v/s planned time

  - Reducing rework in order to reduce cost

  - Increase rate of first-time approval from clients

Congratulations...

...you made it through the presentation!