

Analysis of maintenance planning function deployment in a South African FMCG firm

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Content

"When you establish a destination by defining what you want, then take physical action by making choices that move you towards that destination

(Steve Maraboli)

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INTRODUCTION



Introduction

- South African manufacturing companies need to become internationally competitive
- Due to the current economic situation, many companies are downsizing
- The focus is on minimizing inventory levels and running a “lean enterprise”
- The aim of maintenance is to support and maintain production assets to a satisfactory condition
- Maintenance should no longer be seen as a cost centre, but it needs to be integrated in the business strategies
- Management activities involve planning, organising, leading and controlling

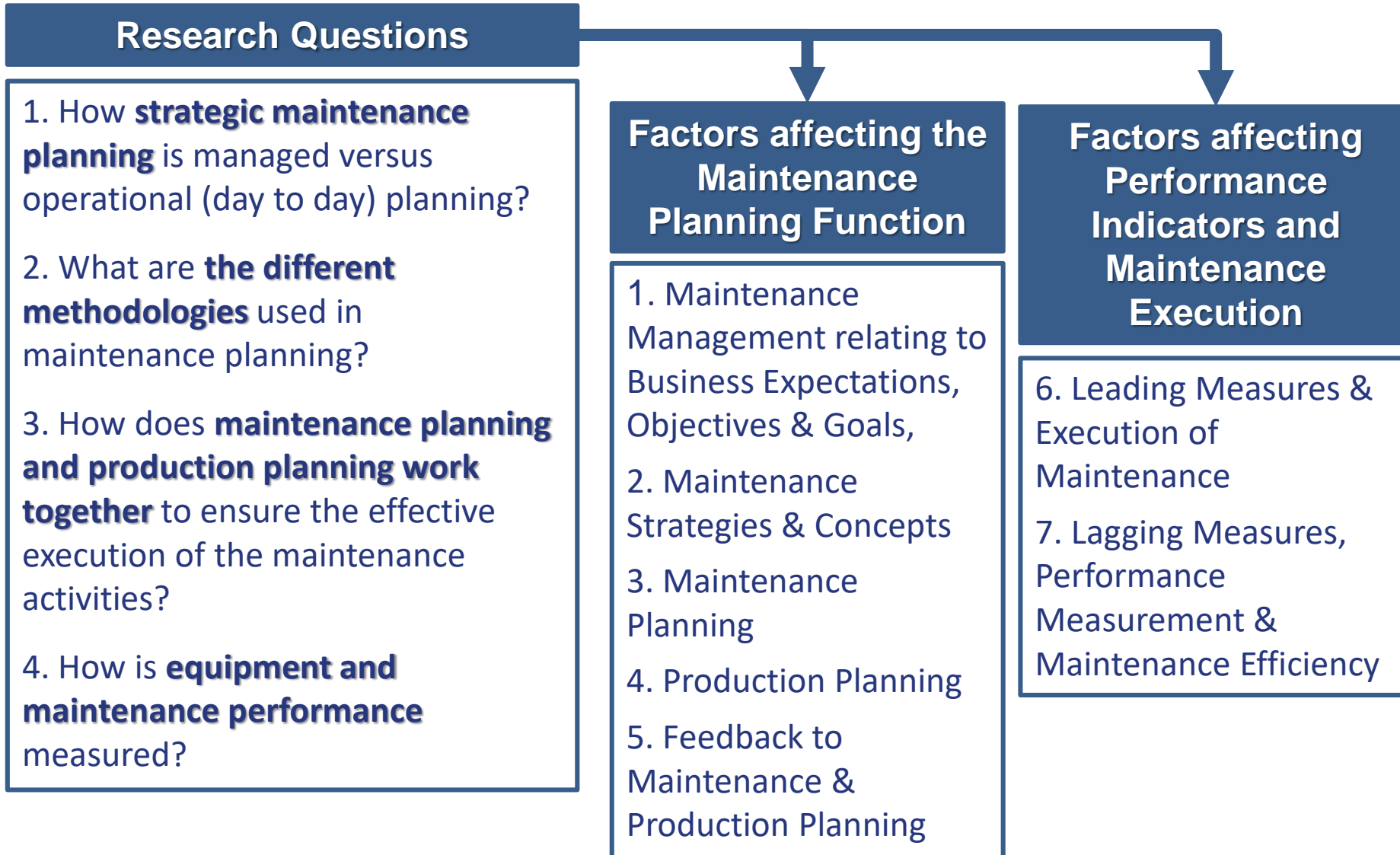


Research Objective

- The main objective of this research was to evaluate the effect of different maintenance planning methodologies on production and maintenance performance and efficiency within the Fast Moving Consumer Goods (FMCG) manufacturing sector
- A sub-objective was to investigate the link between the maintenance planners, the executors of the maintenance tasks and the production department involvement in these activities



Research Questions





LITERATURE AND THEORY



“...maintenance is too often only seen as the execution of maintenance activities with **feedback to the planning function neglected**. This is due to the assumption that operations proceed without problems or variations – which is rarely the case.”

Campbell and Reyes-Picknell (2015)

“The process of **job planning** encompasses **verification of all aspects of the job** to be done as well as identification of the various input resources required to complete each job in an orderly manner and at an optimal overall cost.”

Nyman and Levitt (2001)

“The problem with **measuring maintenance performance** is that the effects of actions taken (or not!) today will reverberate for a long period into the future. It is easy to save money today only to suffer much more expense later”

Sherwin (2000)

Maintenance Planning

- “Planning decides what, how and time estimate for a job. Scheduling decides when and who will do the job. Planning of a job should be done before scheduling a job” (IDCON, 2017)
- “Maintenance planning must happen, in-line with the selected strategies and methods for the equipment. Planning is not complete without proper communication to all stakeholders...” (Nyman and Levitt, 2001)



“Measurement of performance influences behaviour and the objective is to find the right performance measure to influence people’s behaviour in such a way that it helps to achieve an organisation’s goals.”

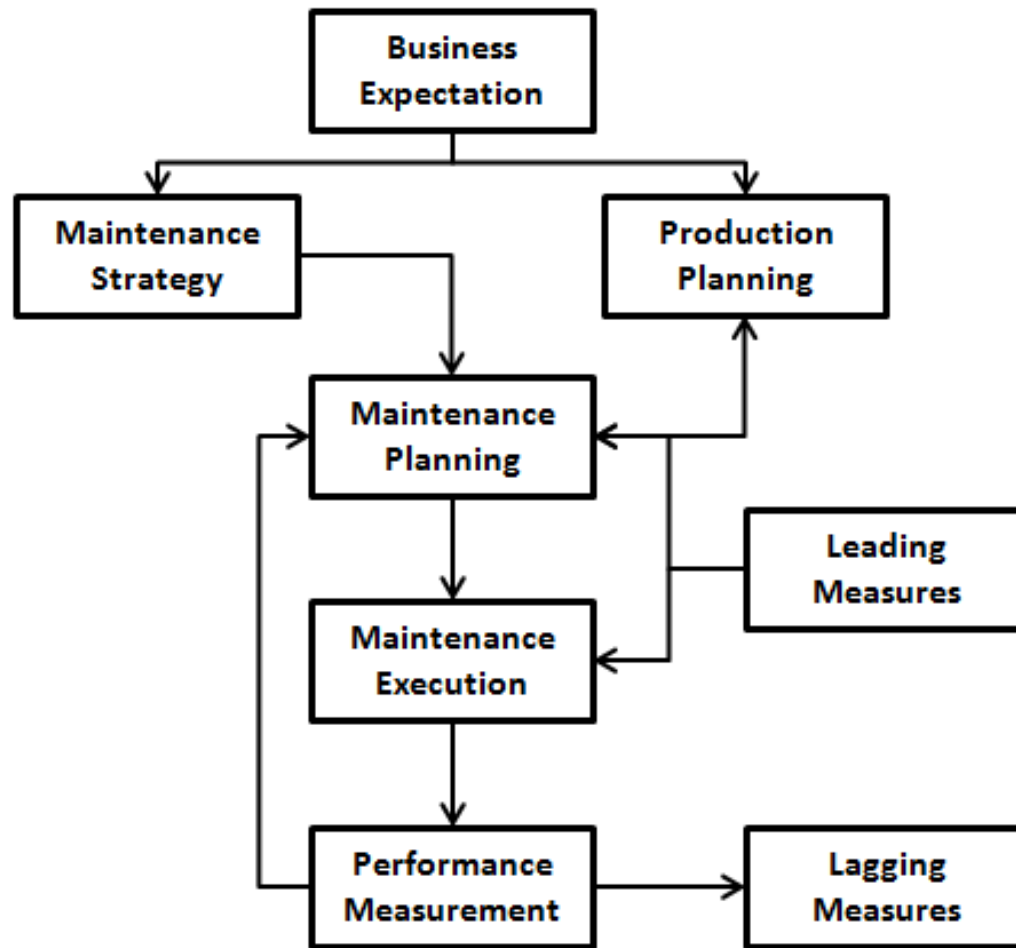
Campbell and Reyes-Picknell, 2015



METHODOLOGY



Conceptual Framework for Outsourcing



Performance Measures



Leading Measures	Lagging Measures
Ratio of Number of Breakdowns + Improvements vs. Planned Maintenance Events	Asset Intensity / Equipment Reliability
Maintenance Store Performance	Planned Maintenance Time of Occupied Time
Maintenance Stores Cycle Count Accuracy	Unplanned Stop Time of Occupied Time
Compliance to Planned Maintenance	Average Mean Time Between Failure
Ratio of Number of Breakdowns + Improvements vs. Planned Maintenance Events	Breakdown Time of Total Runtime

Survey Design

- Online Questionnaire
- 7 Sub-sections
- 45 Likert Type Questions / Statements
- 5 Manufacturing Sites
- 61 Responses
- Management / Planning / Executors

Rating	Definition
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

Example:

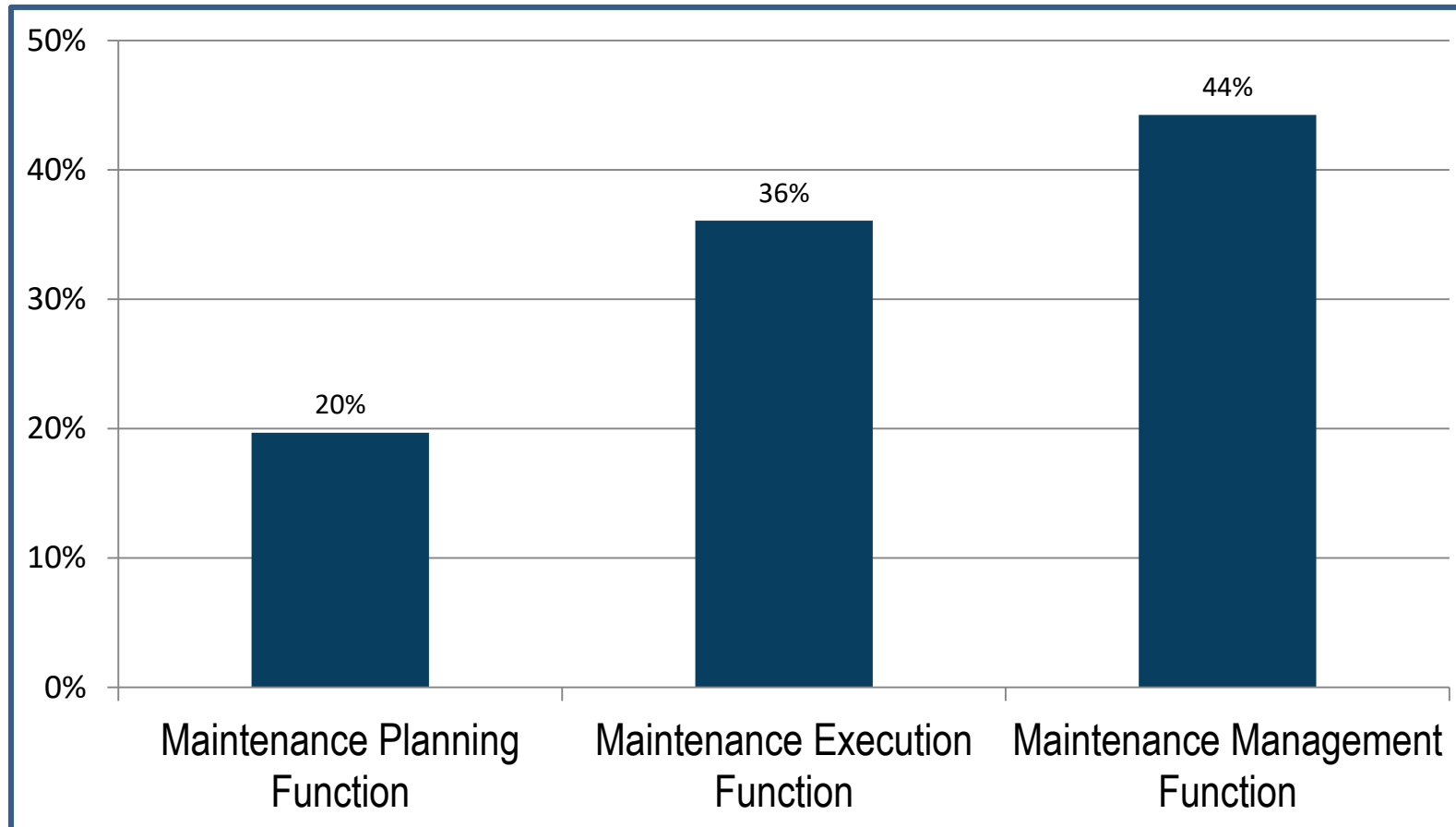
I am fully aware of
the organisational
business objectives



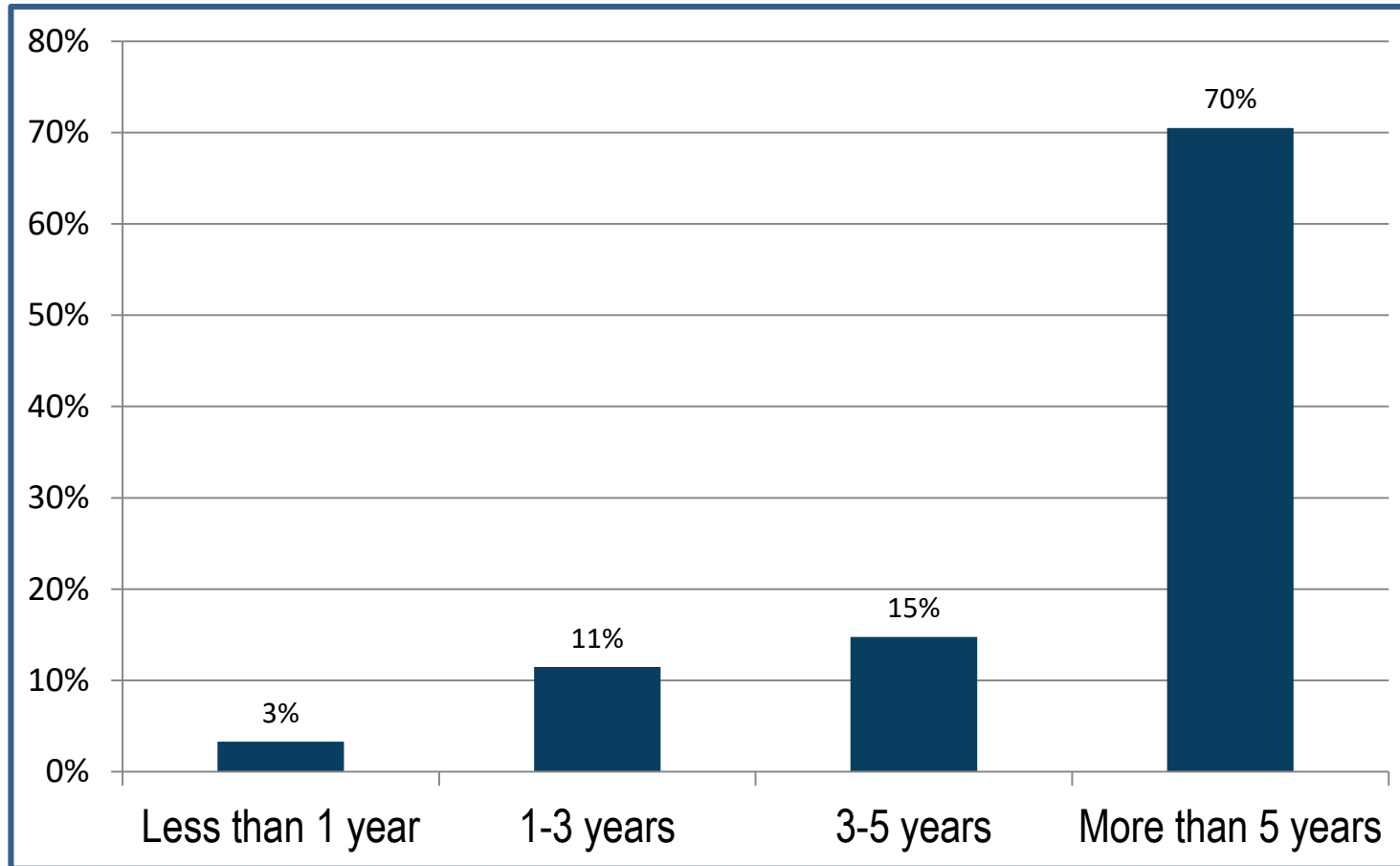
RESEARCH FINDINGS



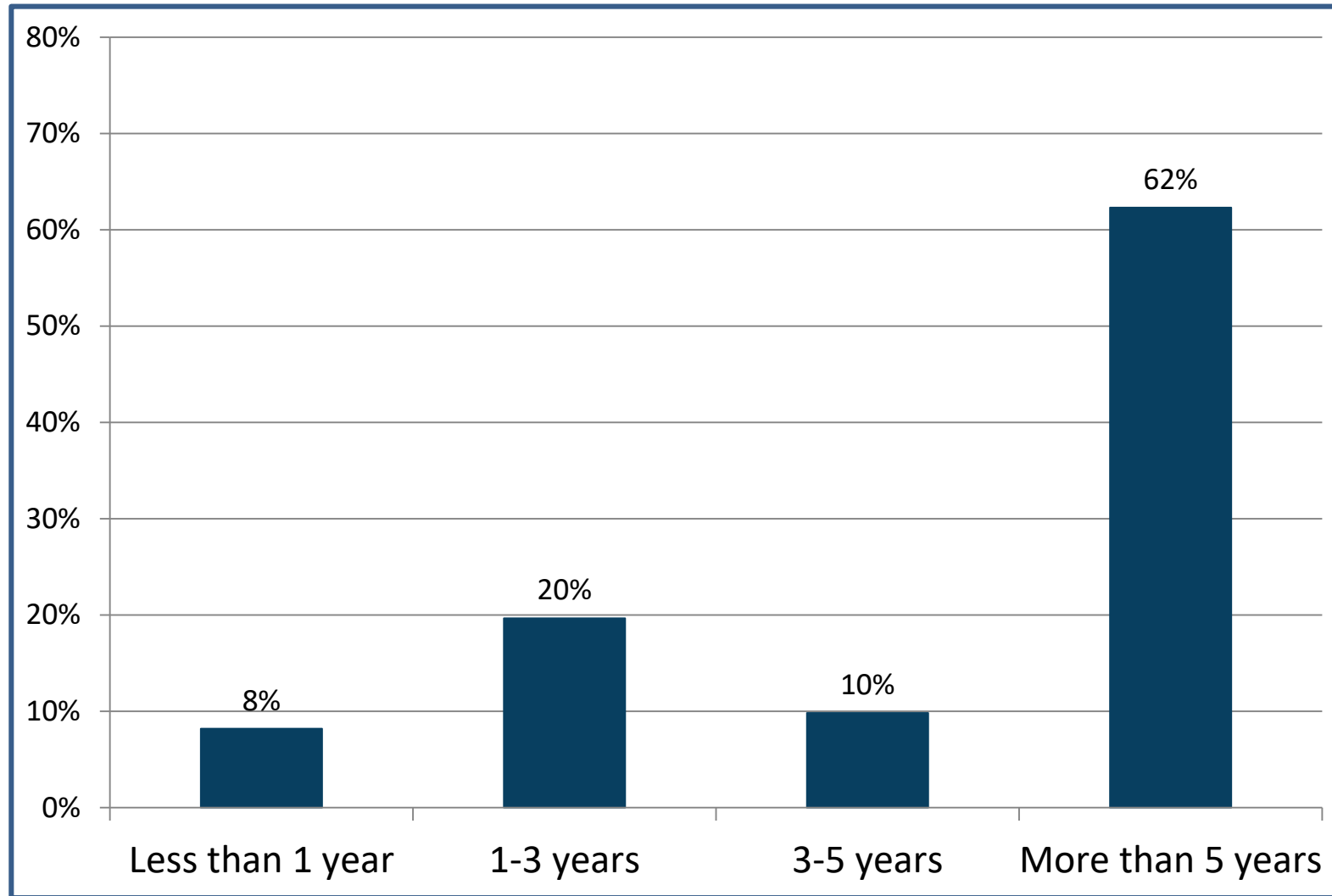
Respondents Job Level



Respondents Experience



Working in Organisation



Performance Data Captured

- Performance data for the 5 manufacturing plants from January 2017 to May 2018 were obtained
- Performance data that were extracted from company information systems included:
 - Maintenance Store Performance (%)
 - Compliance to Planned Maintenance (%)
 - Average Mean-time-between-failure (MTBF)
 - Asset Intensity (equipment reliability) (%)
 - Planned Maintenance Time of Occupied Time (%)
 - Breakdown Time of Total Runtime (%)
 - Number of Breakdowns + Improvements vs. Planned Maintenance Events (%)



Comparison of Factory Performance

Factory Comparisons								
	% Asset Intensity	Rank	Total Equipment Occupied Time	Rank	% Breakdown Time of Total Runtime	Rank	% Unplanned Stop Time of Occupied Time	Rank
Factory C	10	1	3	4	7	4	3	5
Factory B	9	2	10	1	9	2	7	4
Factory A	8	3	6	2	6	5	10	1
Factory D	8	4	4	3	10	1	9	2
Factory E	8	5	2	5	8	3	9	3

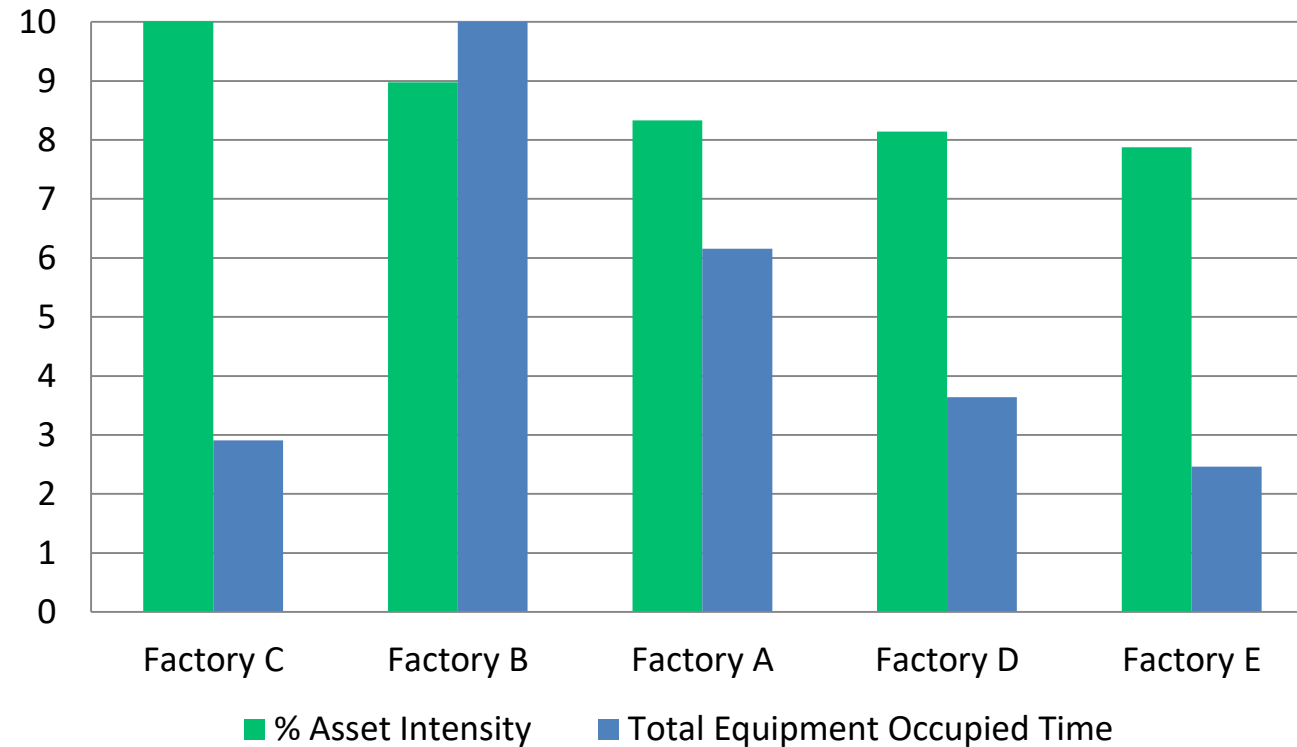


Asset Intensity and Equipment Occupied Time

Asset Intensity

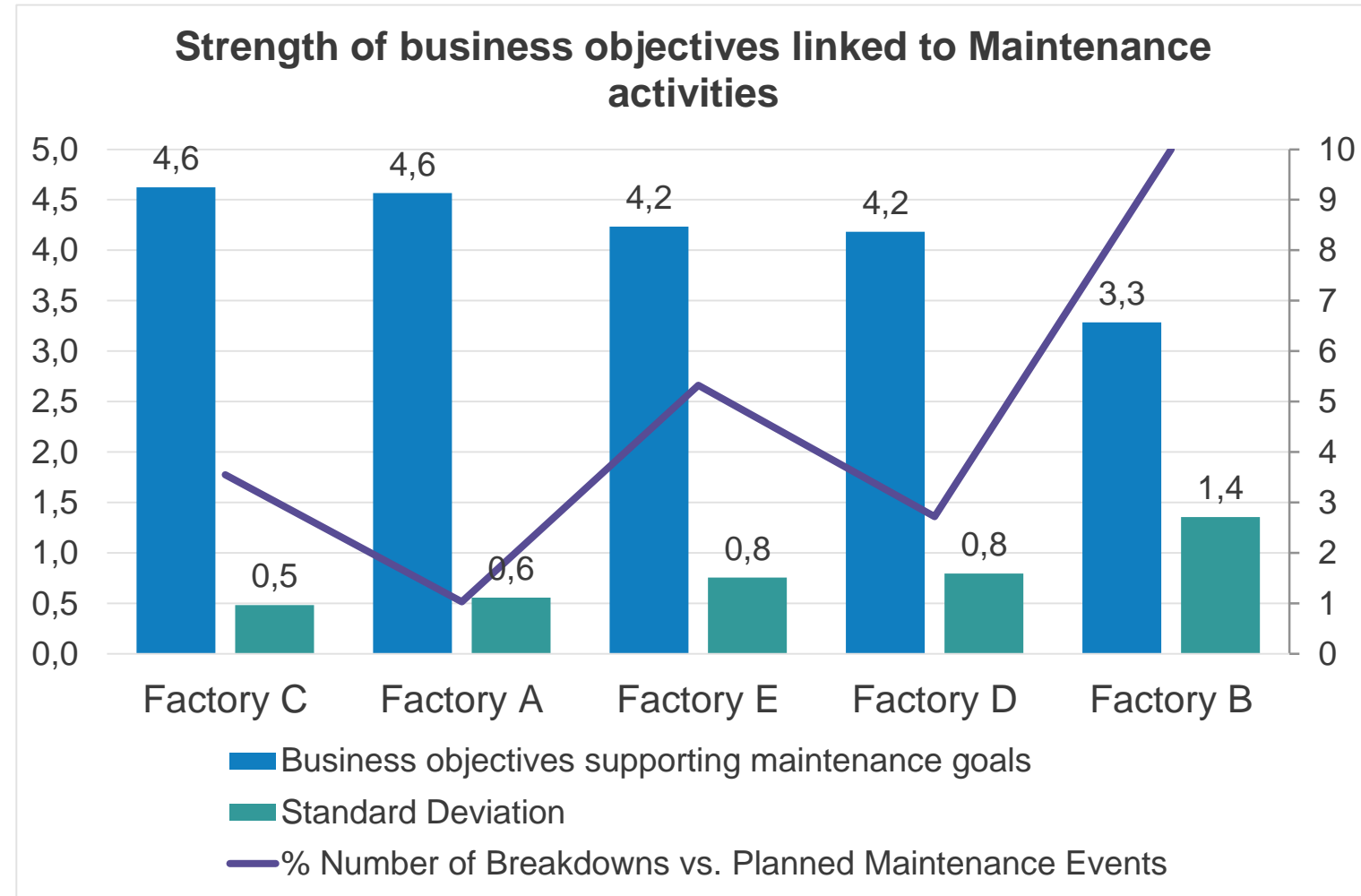
(performance measurement of equipment efficiency)

Good Production Time
Occupied Time



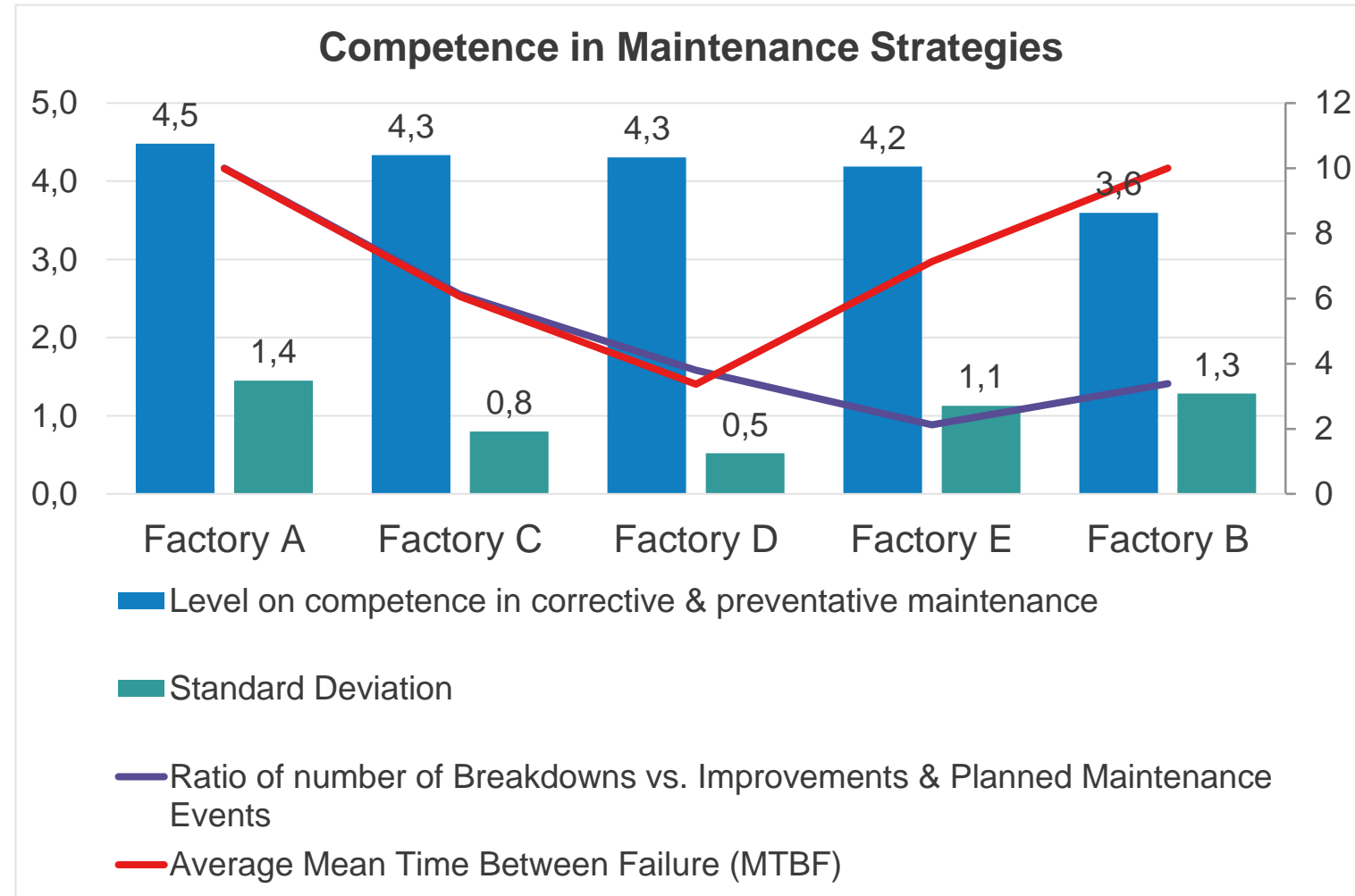
Maintenance strategies and performance

There is a strong correlation between maintenance strategies and business objectives and the performance of the factories based on the ratio of breakdowns vs. planned maintenance events



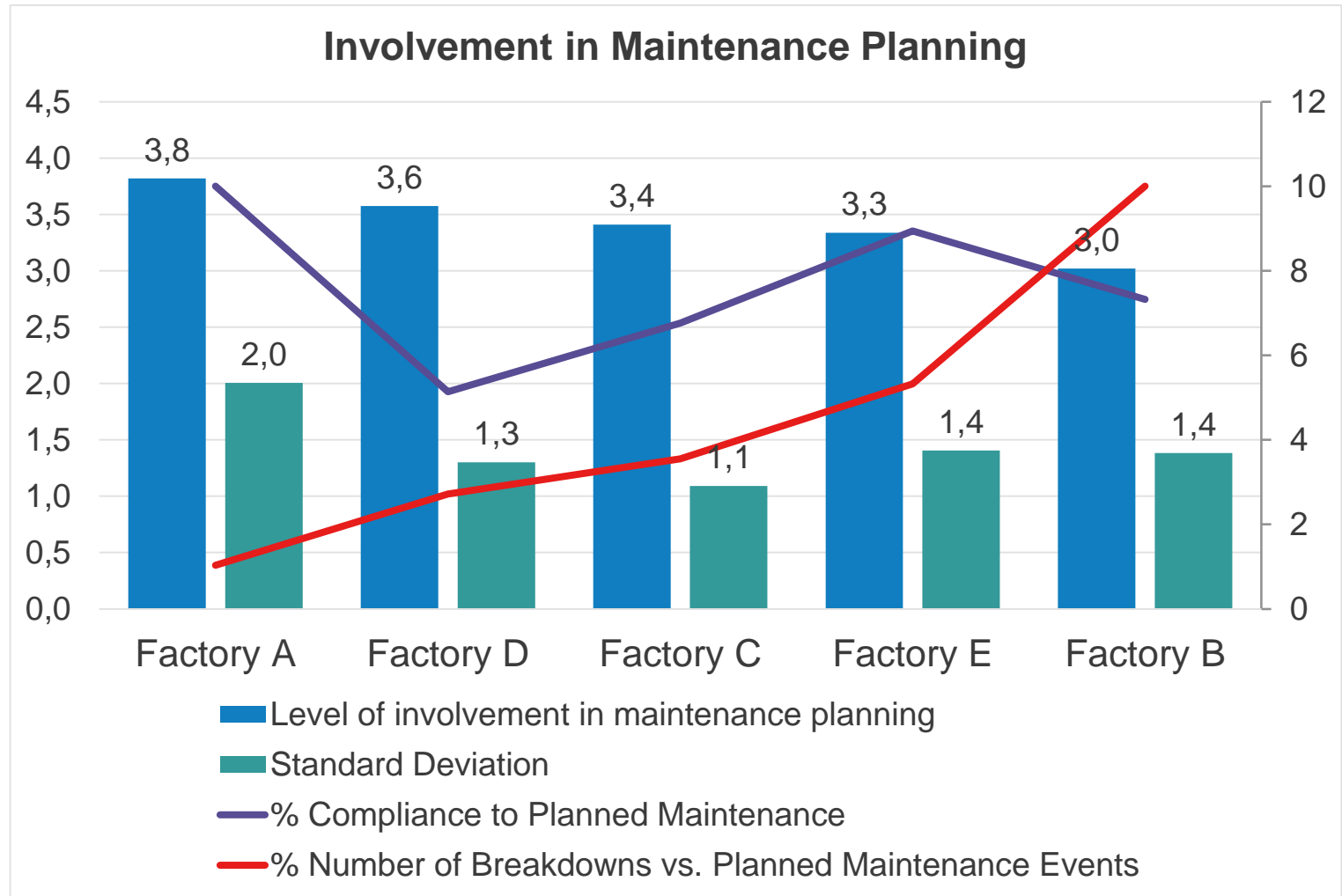
Level of competence and breakdown events

The results indicate that there is a strong link between the competence level in application of corrective and preventive maintenance and the ratio of breakdowns vs. the planned and improvement events

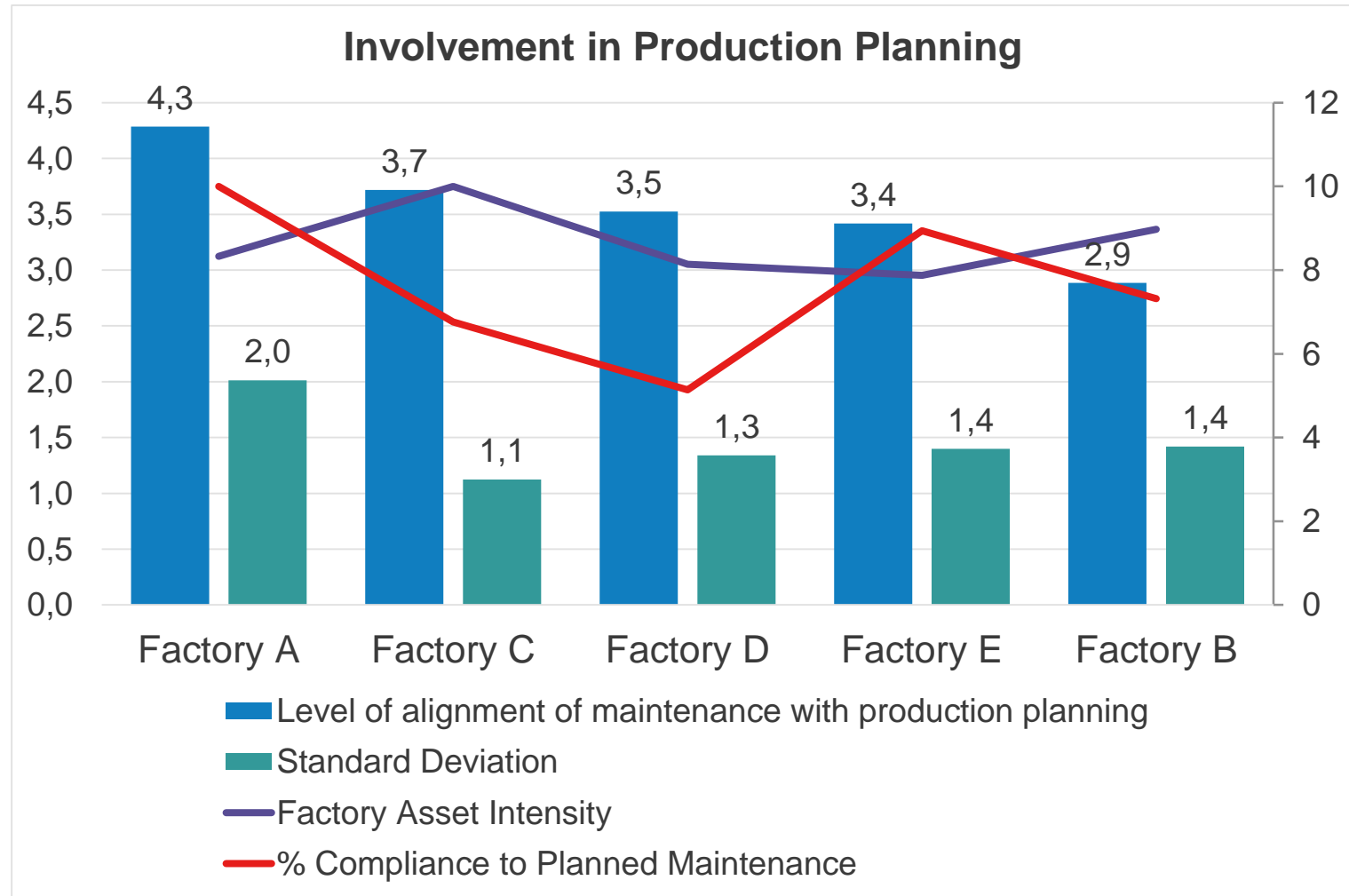


Level of maintenance involvement and breakdowns

There is a strong indication that if a factory has a high level of involvement across all levels of maintenance in the planning of the maintenance activities on a day-to-day basis there is a smaller ratio of breakdowns vs. planned maintenance events. This leads to better reliability.

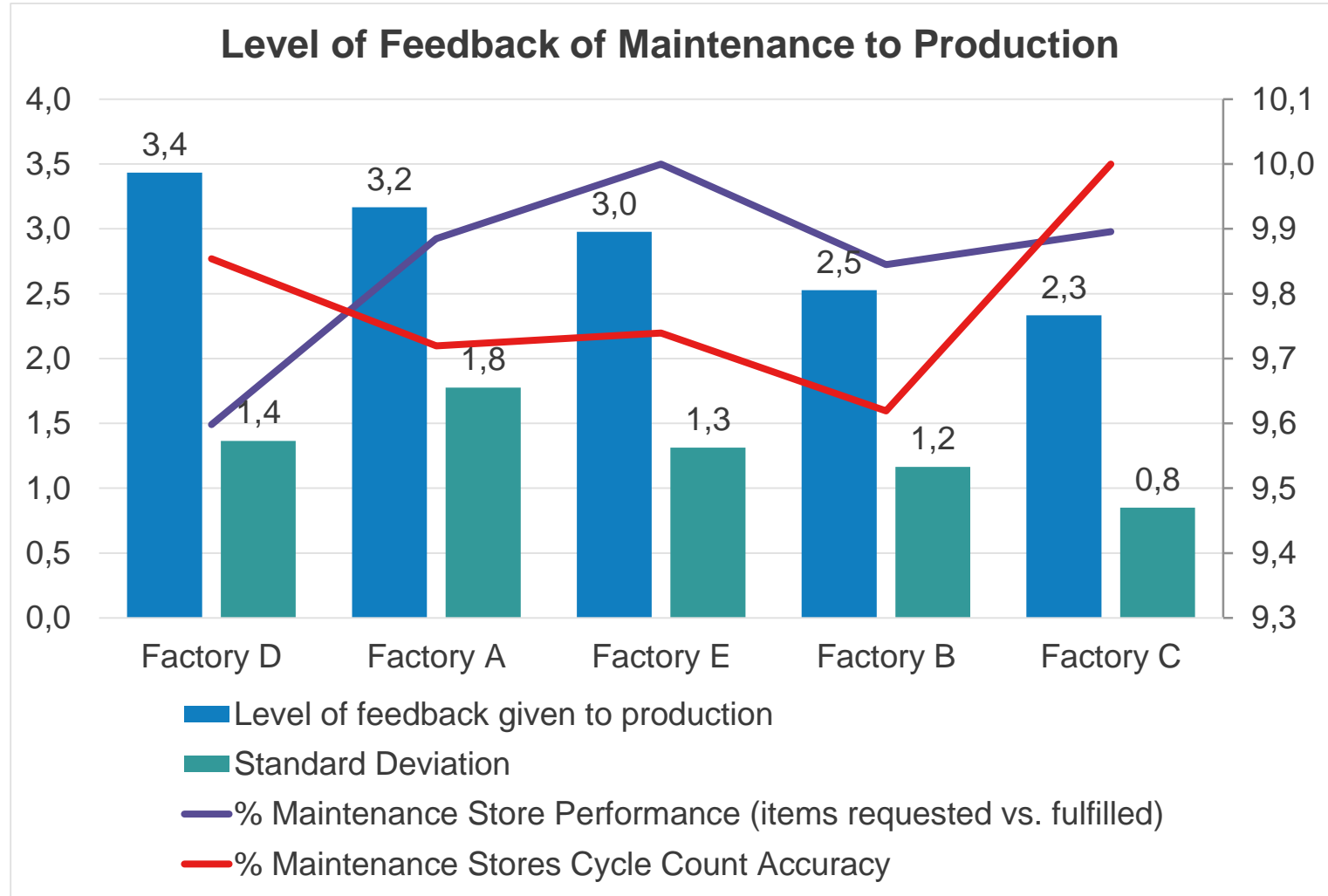


The comparison of the level of alignment of maintenance and production planning and asset intensity provided mixed results and no correlation was found.



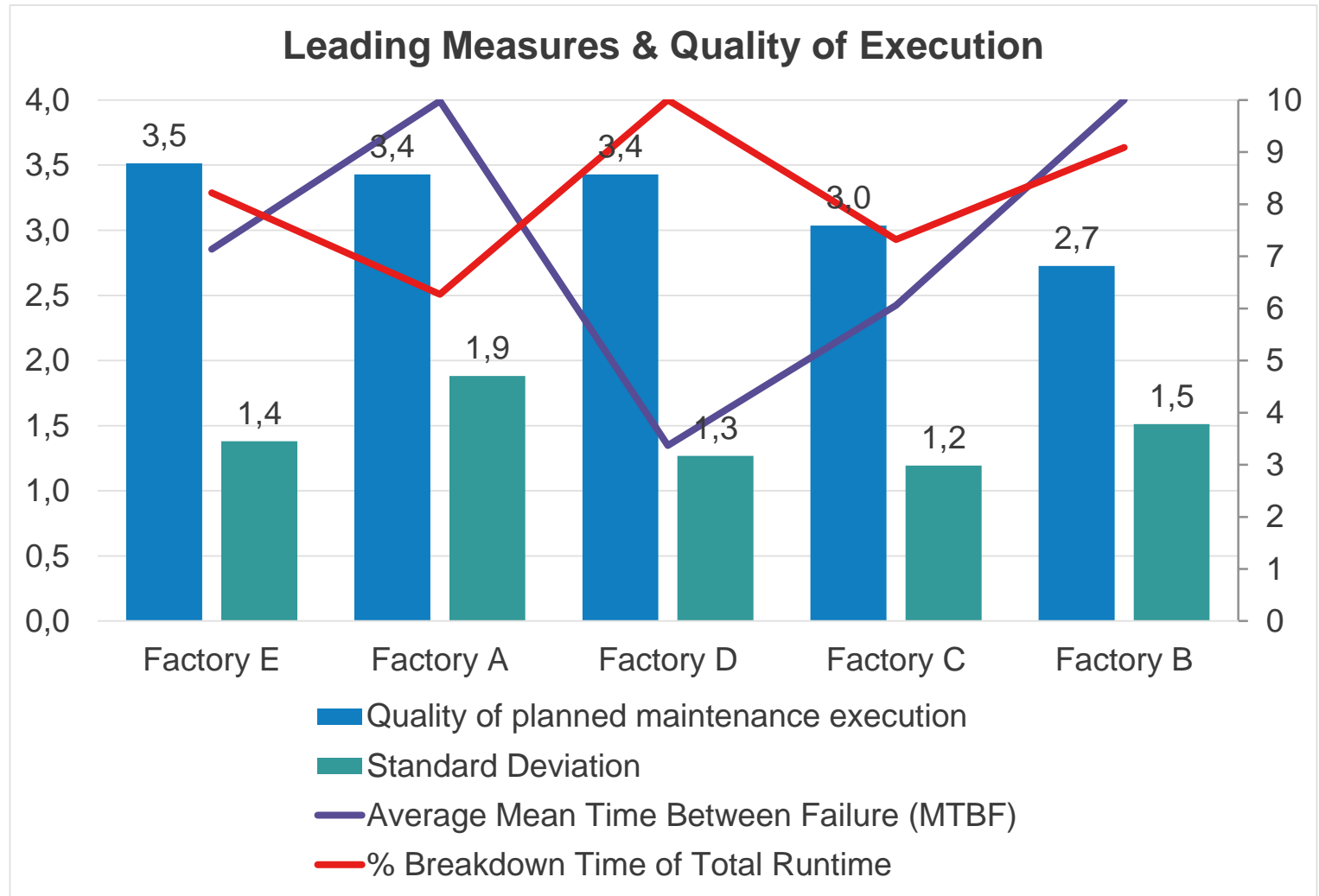
Feedback of maintenance to production

No correlation was found between the level of feedback to production and the maintenance stores performance



Leading measures and maintenance execution

A weak correlation between the leading measures and performance measures was found. Further analysis is required to understand what measures drive the higher performance of the factories





CONCLUSIONS



Conclusions

- Companies with a maintenance strategy that is linked to the business objectives and clearly communicated and linked to the maintenance strategies have better performance in equipment and maintenance
- Having the correct strategies will lead to fewer breakdowns as well as higher performance in maintenance planning
- By incorporating the maintenance strategy into the day-to-day planning and utilising the correct maintenance tools, there is a strong relationship with the asset efficiency
- Involving the entire maintenance department including spare parts management and all other aspects of the planning function improves the performance of the assets



QUESTIONS

Top 10 FMCG Firms



PHILIP MORRIS



L'ORÉAL

Coca-Cola

Keep it real.
Keep it Tyson.



P&G

Procter & Gamble



Johnson & Johnson

