Problem statement worksheet (Hypothesis Formation)

What opportunities exist for Teflan Industries to reduce annual operational costs by $2.5M through overhead rationalization, operational improvements, or restructuring of non-core assets?

H

1 Context

Teflan industries, a family-owned pump provider, has 2 major facilities that produce specialized pumps for use in the construction, mining, water, and utilities industries in regional Western Australia. Operations have indicated that 1 in 4 pumps sent out are returned as defective, with warranty claims costing up to $5M annually. Management has expressed a desire to improve customer experience through improved quality, with this improved customer experience expected to drive improved customer satisfaction as well as reducing warranty-claims by as much as 50%.

2 Criteria for success

- QC System will be adopted and implemented for business use no later than September 30, 2019.

3 Scope of solution space

- QC Systems will be applied specifically at factory A, where the majority of defects occur, and not factory B to better understand the impact on potential production delays.

4 Constraints within solution space

- A large number of OsiSoft PI Tags have N/A values over significant time frames. Some form of linear interpolation or other feature engineering will be needed.

- There does not exist a 'benchmark' score as to when the pump is to be reviewed based off a set score

5 Stakeholders to provide key insight

- XXXXX
- YYYYY
- ZZZZZZ
- XXXXXX
- YYYYYY

6 What key data sources are required?

- OsiSoft PI Database – contains all pump data.

- PumpView System – provides OEM specification data and logs pump maintenance events.

- HIRO Systems – Production System Environment.

H D E I P

The following slides explain what information should be addressed in each element of the problem statement worksheet. Take a look at our recommendations and use them as a guide when creating your own problem statements in the future!

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1 Context

Teflan industries, a family-owned pump provider, has 2 major facilities that produce specialized pumps for use in the construction, mining, water, and utilities industries in regional Western Australia. Operations have indicated that 1 in 4 pumps sent out are returned as defective, with warranty claims costing up to $5M annually. Management has expressed a desire to improve customer experience through improved quality, with this improved customer experience expected to drive improved customer satisfaction as well as reducing warranty-claims by as much as 50%.

Context is one of the key steps in the problem statement worksheet for a very simple reason; If you cannot clearly structure **how** the business initiative is going to solve an existing operational problem, **it is unlikely you will be able to show business value with your problem statement.**

In our example, Teflan industries is primarily suffering from:
1) **Increased Operational Costs** – Increased operational costs directly caused by an inadequate quality-checking process which has led to ~$5M of refunds being issued on an annual basis.

With context, we have **clearly identified the problem at hand** and have elucidated on how our initiative may solve this problem, alongside the commercial implications this will have on the business.

Problem Statements fit broadly into one (1) of two (2) categories:

1) Tangible – Problem statements which result in improved cash flow either through improved production or cost reductions which reduce unit costs. **In this example, our problem is clearly tangible with a direct cashable impact.**

2) Intangible – Problem statements from which no clear cashable benefit can be attributed (i.e. softer, qualitative measures to track value)

In our example, we clearly state how the problem is aligned with the business strategic direction of improving customer experience. More importantly, we do not draw an immediate conclusion as to what the *solution* could be. We keep our statement broad and set the stage for further analysis with issue trees and value driver trees.

Note: All problem statements should inherently **align with a business's strategic objectives** – if you cannot do this, it is likely your initiative will fail to garner sufficient business traction.

Problem statement worksheet (Hypothesis Formation)

What opportunities exist for Teflan Industries to reduce annual operational costs by $2.5M through overhead rationalisation, operational improvements or

2

Criteria for Success is one of the key steps in ensuring your analysis work does not suffer from **scope** creep. In the absence of success criteria, it is not inherently clear **when** the work is to end. By clearly stating success criteria, we can actively avoid scope creep and ensure that we are upfront about when this piece of work is to have 'finished'. **No Problem Statement Worksheet is complete without having clear success criteria stated.**

3

Scope of Solution Space is another key step in the Problem Statement Worksheet. Similar to the success criteria, the scope of the solution space further filters down the scope of the task you are focusing on to a very specific deliverable. In our example, we clearly state that the QC System implementation will focus **only on factory A**, removing any focus from factory B.

2   Criteria for success

- QC System will be adopted and implemented for business use no later than September 30, 2019.

3   Scope of solution space

- QC Systems will be applied specifically at factory A, where the majority of defects occur, and not factory B to better understand the impact on potential production delays.

4   Constraints within solution space

- A large number of staff have expressed confusion over the process change between the automated QC system and the existing manual system. Workshops may need to hosted to streamline this activity.

- A 'benchmark' score does not exist as to when the pump has passed the QC process

4

Constraints within the solution space are an effective way of proactively identifying issues that will occur **before they occur**. This isn't so much 'predictive' foresight, but rather using the information that we know to actively identify issues that may arise before they become a major issue.

This is a key part of the Problem Statement Worksheet. If you are able to effectively identify an issue before it becomes one, you can save time and ensure your analysis goes forward without major issues.

In the example we have highlighted, you can see that, for Teflan employees, there will be confusion regarding the manual QC process versus the automated QC process. There isn't clarity behind this so this will need to be resolved. Additionally, there isn't any information on what the QC score will need to be to qualify a pump as having 'passed'.

By proactively identifying this, we can ensure that this doesn't become problematic in the future when we try to roll out a automated QC system.

Problem statement worksheet (Hy...

What opportunities exist for Teflon Industries to ... by $2.5M through overhead rationalisation, ope... restructuring of non-core assets?

5 **Stakeholders** – No matter how effective your analysis skills may be, you **need** stakeholder input. This isn't just because stakeholders provide backing for the work you do; stakeholders **also** provide key information regarding **why** certain pieces of data may qualify as legitimate outliers or, for example, **how** certain stakeholders should be approached. With a clear stakeholder map, you will have an understanding of all the key players who have a vested interest in the success of your analysis. Without a stakeholder map, **there is no analysis.**

6 **Key Data Sources** – Sections 5 and 6 of the Problem Statement Worksheet are closely linked. By having access to the right stakeholders, you will know which individuals you need to interact with, which will then provide information on which systems you should be approaching / querying to get the relevant data extracts you need for your analysis. This is to ensure that in the one Problem Statement Worksheet you have all the key data sources listed for 1) Accessibility and 2) Visibility.

5   Stakeholders to provide key insight

- Jim Collins (QC Manager)
- Frodo Lilich (QC Engineer)
- Jaine Vulvoich (QC Analyst)
- Ling Zhuong (Senior QC Engineer)

6   What key data sources are required?

- OsiSoft PI Database – contains all pump data.

- PumpView System – provides OEM specification data and logs pump maintenance events.

- HIRO Systems – Production System Environment for all Warranties that have been claimed.

H D E I P