



Q-Rapids

Q-Rapids Dashboard User's Guide

v0.1- January 2018

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1 Introduction

Q-Rapids Dashboard is an analytics and visualization platform designed to support decision makers managing quality requirements. Q-Rapids Dashboard is part of the Q-Rapids framework.

Figure 1 represents the Q-Rapids framework life-cycle extracting data from a software project, which defines its development quality and show it in a visual way through the Q-Rapids Dashboard.

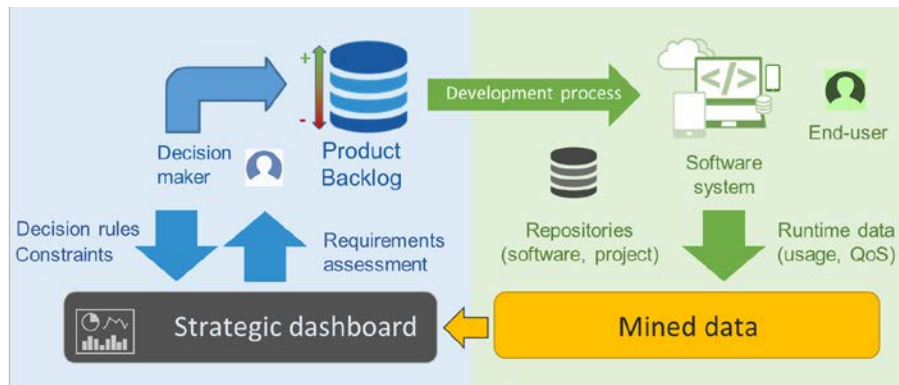


Figure 1. Q-Rapids Framework

The Q-Rapids dashboard is a browser-based interface that supports decision makers, analysts, managers and developers to have a reliable and richer view of data gathered from the different sources and aggregated as strategic indicators. This allows them to interpret the data easily, supporting their decisions in a more efficient way.

2 Basic Concepts

The data managed in the Q-Rapids dashboard is aggregated in several levels of abstraction. The main purpose is to link the data gathered from several data sources to strategic indicators rendered in the strategic dashboard by propagating the calculation upwards the abstraction hierarchy.

Concretely, the Q-Rapids dashboard manages three levels of data:

- **Strategic Indicators.** Aspects that a company considers relevant for the decision-making process.
- **Quality Factors.** Properties of a software product or process (or part of it) that are related to quality. They provide a means to quantify the strategic indicators.
- **Metrics.** They provide a means to quantify the quality factors that characterize a software product or process (or part of it). These metrics are computed directly from the data gathered from the data sources.



3 Main Menu

The Q-Rapids dashboard’s menu (see Figure 2) contains two kinds of options: *Data Views* and *View Mode*.

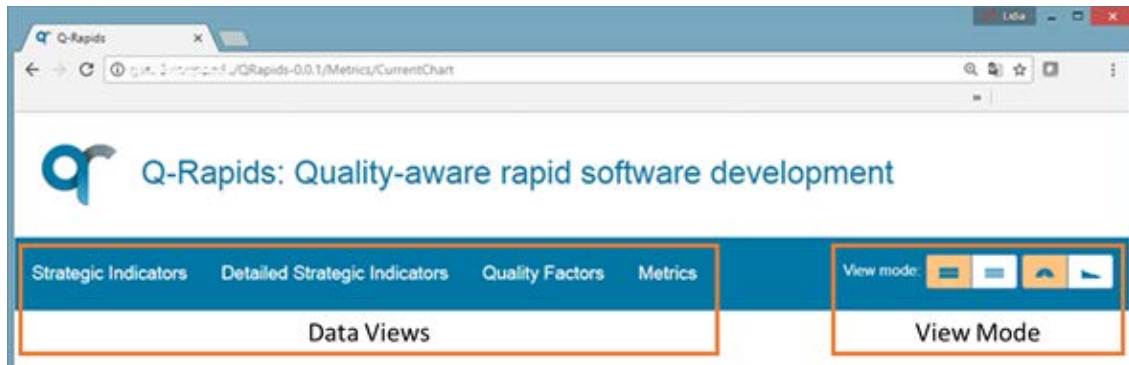


Figure 2. Q-Rapids Dashboard main menu

Data Views (Figure 2, options on the left) corresponds to four views to visualize the different level of data that are detailed in Section 4. *View Mode* (Figure 2, options on the right) corresponds to the different ways to see each kind of data detailed Section **¡Error! No se encuentra el origen de la referencia..**

4 Data Views

Q-Rapids Dashboard visualize the three levels of data according to four different data views:

- **Strategic Indicators.** The dashboard allows to visualize strategic indicators in two ways:
 - *Strategic Indicators Data View.* For each indicator, the decision-maker can see the indicator assessment.
 - *Detailed Strategic Indicators Data View.* For each indicator, the decision-maker can see the assessment of the quality factors used for its computation.
- *Quality Factors Data View:* For each factor, the user can see the assessment of the metrics used for its computation.
- *Metrics Data View:* For each metric, the decision-maker can see the metric assessment.

4.1 Strategic Indicators Data View

The strategic indicators are shown using gauge charts (see Figure 3), this chart allows the decision-maker to see the assessment for each indicator including two thresholds and three quality areas (low, medium, high) associated to red-yellow-green colors.

This view is accessible through the *Strategic Indicators* option in the main menu (Figure 3, highlighted using an orange square). This option shows all the strategic indicators.



Figure 3. Strategic Indicators Data View

For each strategic indicator, the dashboard shows the current value (speedometer needle), a lower and upper thresholds (delimiting the red and green areas respectively), and the target value (black marker in the speedometer) as the value to be reached. Thresholds and target value should be customized by the system administrator.

4.2 Detailed Indicators Data View

The strategic indicators are shown using radar charts (see Figure 4), this allows the decision-maker to see the factors impacting in each strategic indicator and their assessment. Values of the factors are normalized, being 0 the worst value and 1 the best one.

This view is accessible through the *Detailed Strategic Indicators* option in the main menu (Figure 4, highlighted using an orange square). This option shows all the strategic indicators.



Figure 4. Detailed Strategic Indicators Data View

4.3 Quality Factors Data View

Quality factors are shown using radar charts (see Figure 5), this allows the decision-maker to see the metrics used to compute each factor. These metrics are again normalized to values between 0 to 1, being 0 the worst value and 1 the best one.

This view is accessible through the *Quality Factors* option in the main menu (Figure 5, highlighted using an orange square). This option shows all the quality factors.

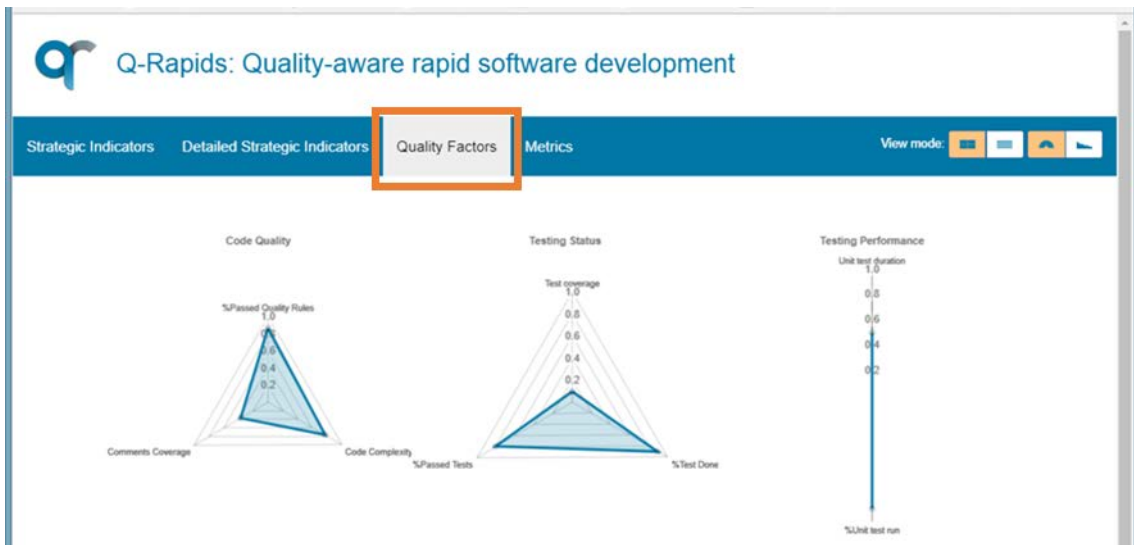


Figure 5. Quality Factors Data View

4.4 Metrics Data View

The values shown by the dashboard are the normalized values and there is no information about the thresholds to classify these values as low-medium-high quality. Therefore, there is no view to show the current value for the metrics in a chart. This information is shown in a table (see Figure 6).

This view is accessible through the *Metrics* option in the main menu (Figure 6, highlighted using an orange square). This option shows all the quality related factors.

Metric	Current Value
% files without duplications	0.87
% non-complex files	0.77
% commented files	0.37
%Passed Quality Rules	0.87
Test Coverage	0.25
%Test Done	0.90
%Test Passed	0.80
Unit Test Duration	0.50
Unit Test Run	0.90

Figure 6. Metrics Data View



5 View Modes

The data shown in each of the four data views (Strategic Indicators, Detailed Strategic Indicators, Quality Factors, and Metrics) can be tailored by the decision-maker choosing:

- **Assessment Mode**: the dashboard can show the “current” assessment value or historical data.
- **Visualization Mode**: the dashboard can show the data in a graphical way (using charts as done in the previous section) or in a textual way (showing the data arranged in tabular form).

These options are located on the right side of the menu (Figure 7). The two option groups (**Assessment Mode** and **Visualization Mode**) allow four combinations for each of the data view (Strategic Indicators, Detailed Strategic Indicators, Quality Factors, and Metrics).

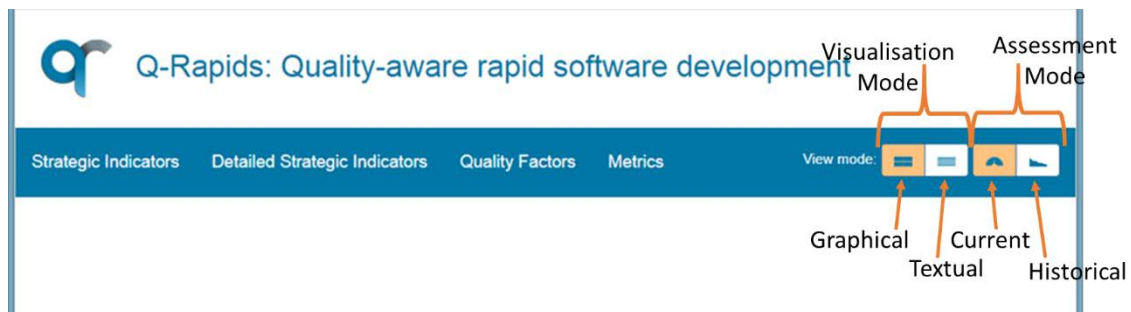


Figure 7. View Mode menu

5.1 Visualization View Mode

5.1.1 Graphical Visualization Mode

The **Graphical Visualization Mode** options present the data using charts. System use different kind of chart depending on the data is showing. For example, gauge charts (Figure 8, left) as the most generic view for the strategic indicators (**Strategic Indicators Data View**) and radar charts (Figure 8, right) to include more than one element, e.g. when for each strategic indicator the chart includes all the factors impacting on it.

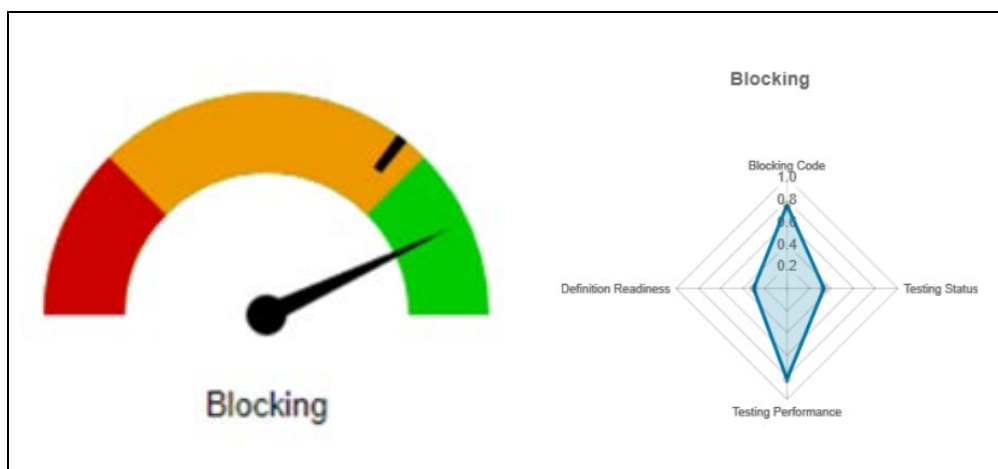


Figure 8. Graphical Visualization Mode



5.1.2 Textual Visualization Mode

The *Textual Visualization Mode* options present the data in a tabular way. The number of columns depend on the data is showing, for example in the *Strategic Indicators Data View* there is a 5-column table (name, assessment value, target, lower threshold and upper threshold), and for the *Detailed Strategic Indicators Data View* a 3-column table (strategic indicator name, factor name and assessed value).

5.2 Assessment View Mode

5.2.1 Current Visualization Mode

All the figures included in Section 4 correspond the *Current Value* visualization mode. Therefore, the decision-maker is visualizing the last value calculated for each element. These values can be visualized graphically (Figure 9, left) or textually (Figure 9, right) as is explained in previous section.

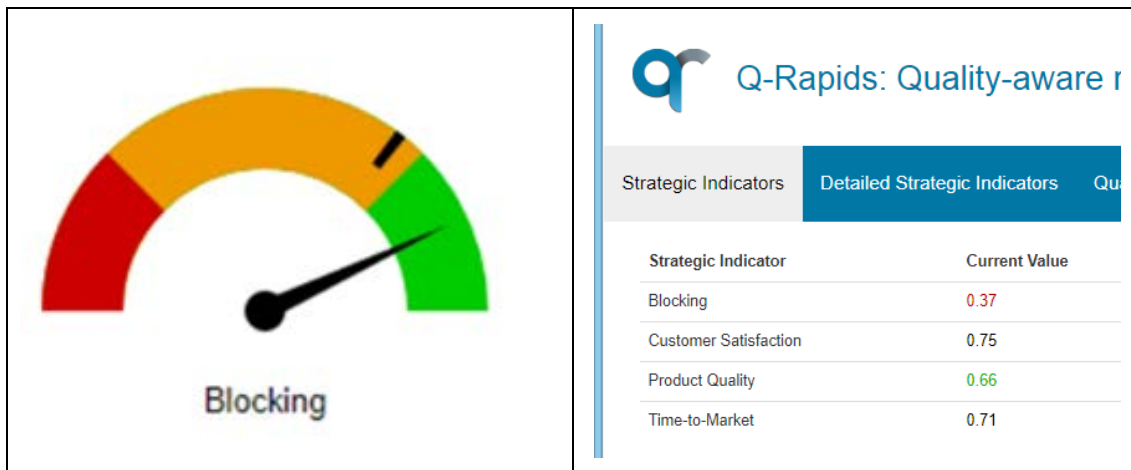


Figure 9. Current Visualization Mode

¡Error! No se encuentra el origen de la referencia. corresponds to the combination *Current Value* and *Textual View* for the *Strategic Indicators Data View*. Each row contains the name of the strategic indicator, current value, target value, and thresholds (lower and upper). The current value is colored simulating the quality areas: red if the value is bellow than the lower threshold (Figure 10, Blocking) or green if the value is greater than the upper threshold (Figure 10, Product Quality).

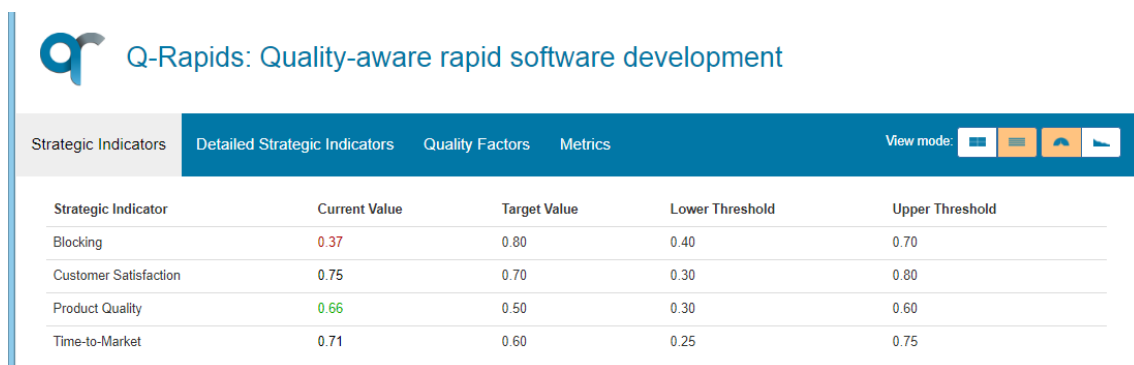


Figure 10. Strategic Indicators current and textual view



5.2.2 Historical Data Visualization Mode

The system allows to the decision-maker to explore the evolution of the data using the *Historical Data* visualization mode available in all the data views. Figure 11 corresponds to the combination *Historical Data* and *Graphical View* for the *Strategic Indicators Data View*. The same combination for *Metrics Data View* produces a visualization with the same kind of charts: line charts with one series. In the *Strategic Indicators Data View*, lower and upper thresholds and target are shown using a horizontal line which corresponds to red, green and blue respectively.



Figure 11. Strategic Indicators historical and graphical view

The same combination (*Historical Data* and *Graphical View*) for the *Detailed Strategic Indicators Data View* produces the result shown in Figure 12, where line charts represent more than one series of values, one per factor impacting the strategic indicator. The same type of visualization is produced for the *Quality Factors Data View*.

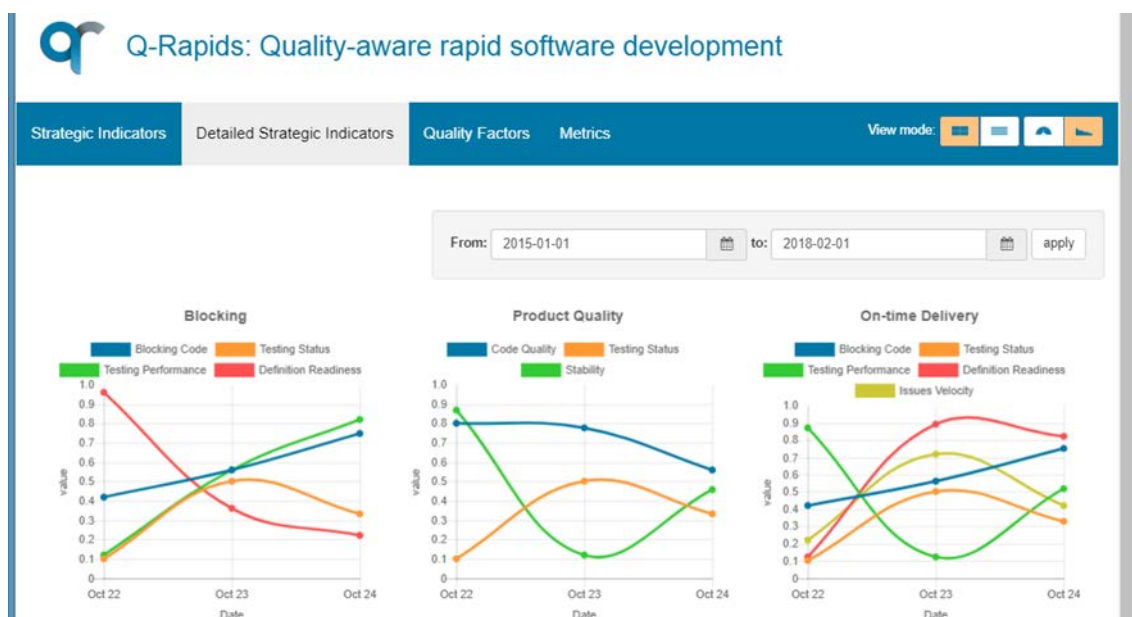


Figure 12. Detailed Strategic Indicators historical and graphical view



For the combination *Historical Data* and *Textual View* in the *Strategic Indicators Data View*, a table including all the assessments for each indicator is shown (see Figure 13).

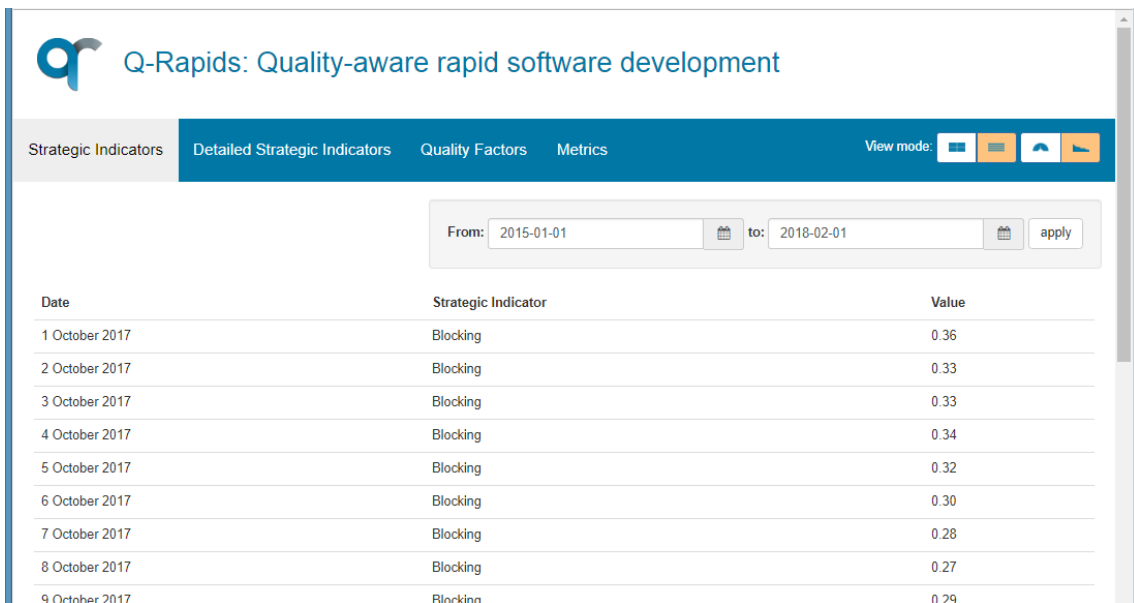


Figure 13. Strategic Indicators historical and textual view

All of the historical data visualizations can be filtered by date using the filter shown in Figure 14 (highlighted using an orange square). The decision-maker can select “from” and “to” dates using the date pickers in the calendar icon buttons and select apply to filter the dates.

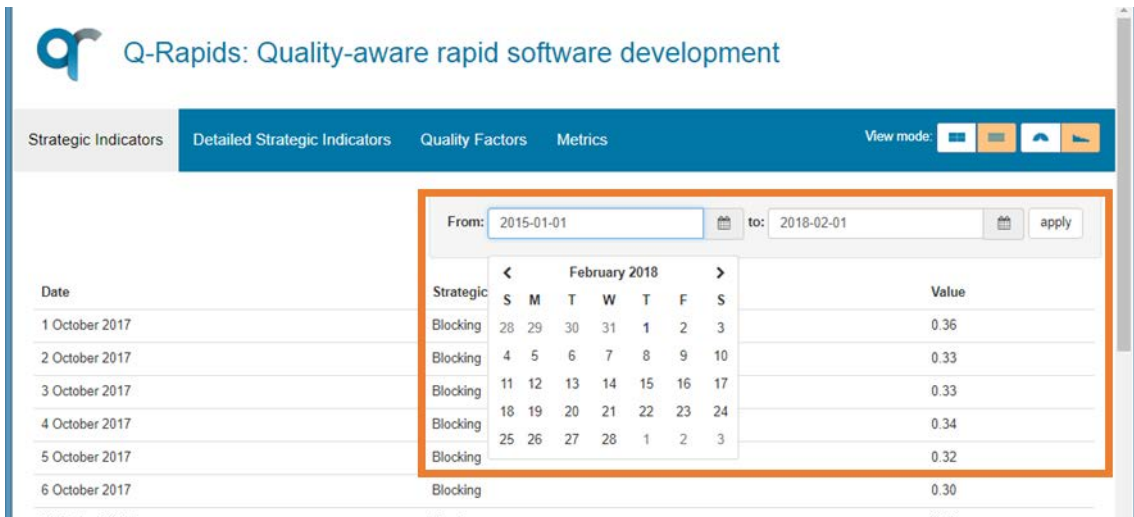


Figure 14. Filtering historical data



6 Exploring the Assessment Values Rationale

In order to explore the rationale behind the value of strategic indicators, the Q-Rapids dashboard allows the decision-maker to navigate from one data view to another for a specific indicator and a specific factor following the sequence:

Strategic Indicator ↔ Detailed Strategic Indicator ↔ Quality Factor ↔ Metric

In order to inspect a strategic indicator or factor, the decision-maker needs to click in the corresponding chart. In the resulting data view, the dashboard includes the path at the top of the visualization area. This [link](#) can be used to go back to the previous view (Figure 15, highlighted using an orange square).

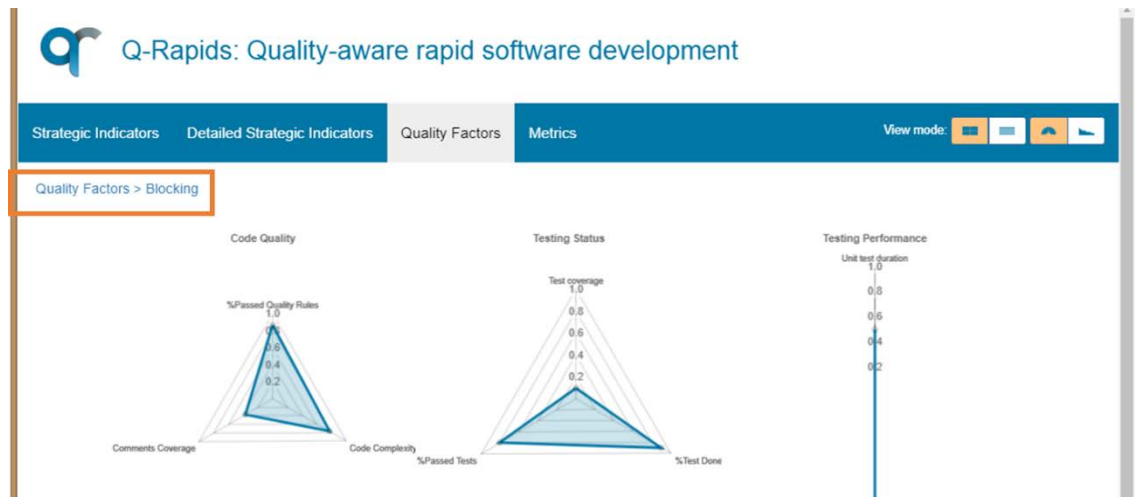


Figure 15. Navigation links

The following images exemplify how to navigate through the data related to the Blocking strategic indicator. Initially, the dashboard is in the *Strategic Indicators Data View*:

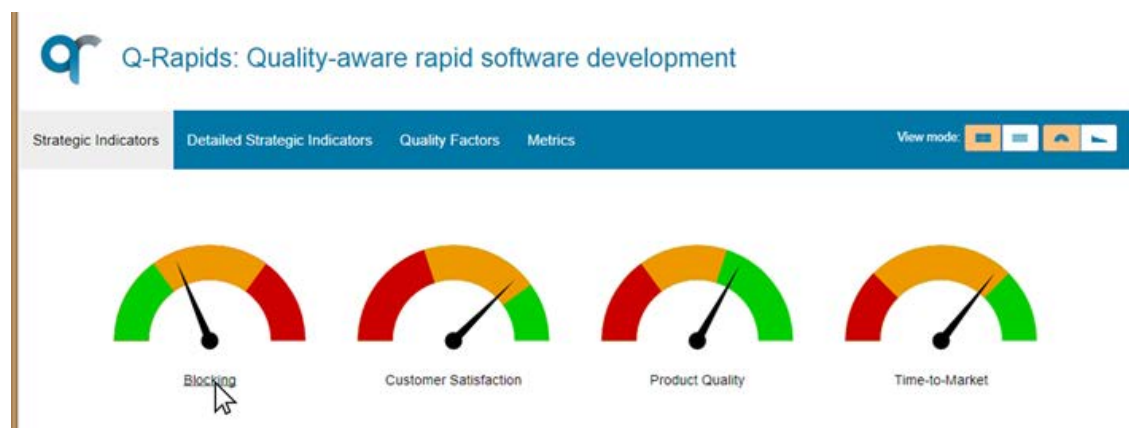


Figure 16. Navigation - starting view

If the decision-maker clicks on the Blocking gauge, the dashboard will change into the *Detailed Strategic Indicators Data View* showing only the selected Blocking indicator. At the top of the visualization area, the dashboard shows the path that has been followed to arrive to this data



view, in this example [“Strategic Indicator: Blocking”](#). This link can be used to change back to the *Strategic Indicators Data View*:



Figure 17. Navigation - Detailed view for Blocking strategic indicator

In this situation, when the decision-maker clicks on the specific Blocking radar chart, the dashboard will change into the *Quality Factors View*, including only the factors impacting in the selected indicator (in this case, Testing Status, Blocking Code, Testing Performance and Definition Readiness). At the top of the visualization area (highlighted using an orange square), the dashboard shows the path that has been followed to arrive to this view, in this example [“Strategic Indicator: Blocking”](#). This link can be used to change back to the *Detailed Strategic Indicators View*:

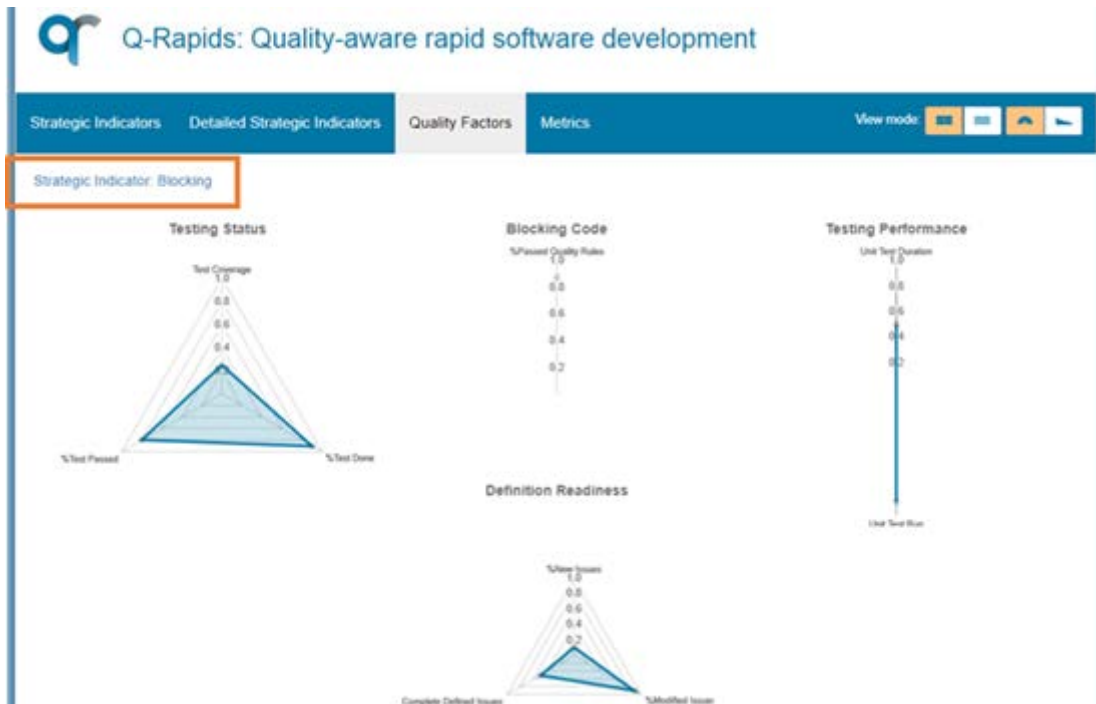


Figure 18. Navigation - Factors impacting Blocking strategic indicator



If the decision-maker clicks on a specific quality factor radar chart (e.g. Testing Status), the dashboard will change into the *Metrics Data View*, including only the metrics used to compute the selected factor (in this case, Test Coverage, %Test Done and % Test Passed). At the top of the visualization area, the dashboard shows the path that has been followed to arrive to this view, in this example “[Quality Factor: Blocking > Testing Status](#)”.

The decision-maker could change back to the *Strategic Indicators Data View* clicking on the name of the strategic indicator (Blocking) or to the Quality Factors Data View clicking on the factor name (Testing Status):

