

1. ✓ [News in Version 7](#)
 1. ✓ [Foreword](#)
 1. ✓ [Conversion and data exchange](#)
 2. ✓ [Outlook on Functional Safety](#)
 3. ✓ [Outlook on FMEA MSR](#)
 2. ✓ [Operational concept](#)
 1. ✓ [The new input collector](#)
 2. ✓ [Toolbars at the workspaces](#)
 3. ✓ [Auto complete support in Structure list and Function/Failure analysis](#)
 4. ✓ [Extended input fields in Structure list and Function/Failure analysis](#)
 5. ✓ [New folding operations](#)
 6. ✓ [Create last structure level automatically](#)
 7. ✓ [Focus in the Structure tree](#)
 8. ✓ [Context menu for Hot-click symbols](#)
 9. ✓ [Background color for objects](#)
 10. ✓ [The new Object Inspector](#)
 11. ✓ [Hide empty rows in the Object Inspector](#)
 12. ✓ [New structuring in Display options, Document and Workstation settings](#)
 13. ✓ [Zoom](#)
 14. ✓ [Catalogs - Details of instance count](#)
 15. ✓ [Multiple copying](#)
 16. ✓ [Modularize structure subsequently](#)
 17. ✓ [Activate Application components](#)
 18. ✓ [Computer based training / Learning units](#)
 19. ✓ [Conversion of process elements to system elements](#)
 3. ✓ [Action analysis and FMEA form](#)
 1. ✓ [Hot-click symbol for the Cover sheet](#)
 2. ✓ [Create Cover sheet via header data](#)
 3. ✓ [Simultaneous opening of multiple FMEA forms](#)
 4. ✓ [New formsheet columns for S*O, O*D and S*D](#)
 5. ✓ [Valuations in brackets](#)
 6. ✓ [Filter criteria for action groups](#)
 7. ✓ [Excel export with colors, symbols and graphics](#)
 8. ✓ [Cascaded \(relative\) symbolic deadlines](#)
 9. ✓ [RPN/AP calculation for Failure nets with 2 levels](#)
 10. ✓ [Statistics - Icons für Analysis types](#)
 11. ✓ [Statistics with incompletely rated revision state](#)
 12. ✓ [Assigning multiple classifications](#)
 4. ✓ [Generate operating figures of the FMEA](#)
 1. ✓ [Management Report Editor](#)
 2. ✓ [Summary Function](#)
 5. ✓ [New settings](#)
 1. ✓ [Fonts and colors / selection color](#)
 2. ✓ [Transfer settings to a different workstation](#)
 3. ✓ [Management for user information](#)
 6. ✓ [Adopt and check data](#)
 1. ✓ [Quality rules](#)
 2. ✓ [Audit Trail](#)
 3. ✓ [Innovations for filters](#)
 7. ✓ [Translate](#)
 1. ✓ [DeepL Pro integration of the translation service](#)
 2. ✓ [Single projects/structures in terminology control](#)

8. ✓ [AIAG/VDA FMEA Handbook \(2019\)](#)
 1. ✓ [FMEA scope analysis](#)
 2. ✓ [Structure type AIAG/VDA MSR \(2019\)](#)
 3. ✓ [Action Priority catalog](#)
 4. ✓ [Statistics by AP](#)
 5. ✓ [Valuation catalogs](#)
 6. ✓ [Embedding of diagrams \(e.g. Boundary Diagram\)](#)
 7. ✓ [P-Diagram](#)
 8. ✓ [AIAG/VDA Form](#)
 9. ✓ [Six Sigma tools](#)
 1. ✓ [Pairwise Comparison Matrix](#)
 2. ✓ [House of Quality](#)
 10. ✓ [Further editors](#)
 1. ✓ [Design Verification Plan and Report \(DVP & R\)](#)
 11. ✓ [Miscellaneous](#)
 1. ✓ [Command-Line Bookmarks](#)
 2. ✓ [Palette representation based on previously selected representation](#)
 3. ✓ [Customer Requirements Management](#)
 4. ✓ [Presentation print / Web Publisher](#)
 5. ✓ [Process Flow Diagram line color](#)
-
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News in Version 7

Foreword

The release of the APIS IQ software Version 7.0 includes a great variety of innovations. This document gives an overview of the most important new features.

Since the release of the new AIAG & VDA FMEA Handbook on 3rd June 2019 it was still possible to make several adaptations. We are pleased to take your feedback on Version 7.0 and we will seek to respond constructively.

More functionalities and changes will be implemented with service packs, which we provide regularly.

Changes which were already implemented in service packs for Version 6.5, are described in the respective Readme file. A few select of those features were also integrated in this document.

After a new major release of the APIS IQ software you can find the news and changes also within the topic [News in Version...](#) in the online Help.

Conversion and data exchange

After installing the new version of the APIS IQ software, older documents need to be converted before they can be edited. The APIS IQ software executes this step automatically. When opening an IQ document with write access, the IQ software checks with which version the document was created and converts automatically if necessary. But it is also possible, to convert all documents of a directory automatically in one step.

Previous versions of the APIS IQ software cannot work with documents, which were already converted into the current format.

If it is necessary to provide other users, who do not have the current program version, with the document, we recommend to keep old documents for a certain period of time. The installation of the new version of the APIS IQ software requires a different program directory than the previous one.

Important: The documents created with the APIS IQ software may in no case be edited by any other program. This destroys the data and leads to software errors.

Use the existing interfaces for data exchange with other systems.

Outlook on Functional Safety

The release of V 7.0 does not include any of the planned innovations in the field of Functional Safety. That means, the functionality there is the same as in V6.5. However, preparations were done to implement the collected requirements with one of the next service packs.

Outlook on FMEA MSR

The method with Frequency (F) and Monitoring (M) described in the AIAG & VDA FMEA Handbook (2019) will not be implemented entirely with the first release of V7.0. According additions will be provided with one of the next service packs.

Operational concept

[The new input collector](#)

[Toolbars at the workspaces](#)

[Auto complete support in Structure list and Function/Failure analysis](#)

[Extended input fields in Structure list and Function/Failure analysis](#)

[New folding operations](#)

[Create last structure level automatically](#)

[Focus in the Structure tree](#)

[Context menu for Hot-click symbols](#)

[Background color for objects](#)

[The new Object Inspector](#)

[Hide empty rows in the Object Inspector](#)

[New structuring in Display options, Document and Workstation settings](#)

[Zoom](#)

[Catalogs - Details of instance count](#)

[Multiple copying](#)

[Modularize structure subsequently](#)

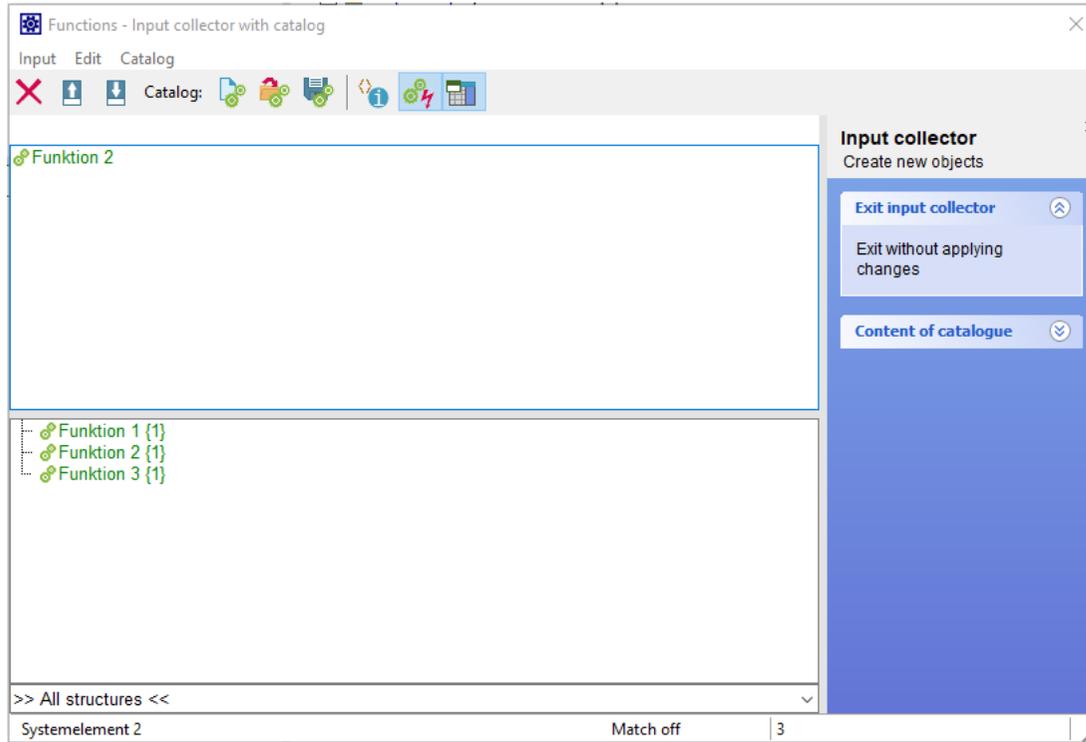
[Activate Application components](#)

[Computer based training / Learning units](#)

[Conversion of process elements to system elements](#)

The new input collector

The input collector has been reworked and now, in addition to a suggestion list, also has an auto complete list. This replaces the incremental search and the filters.



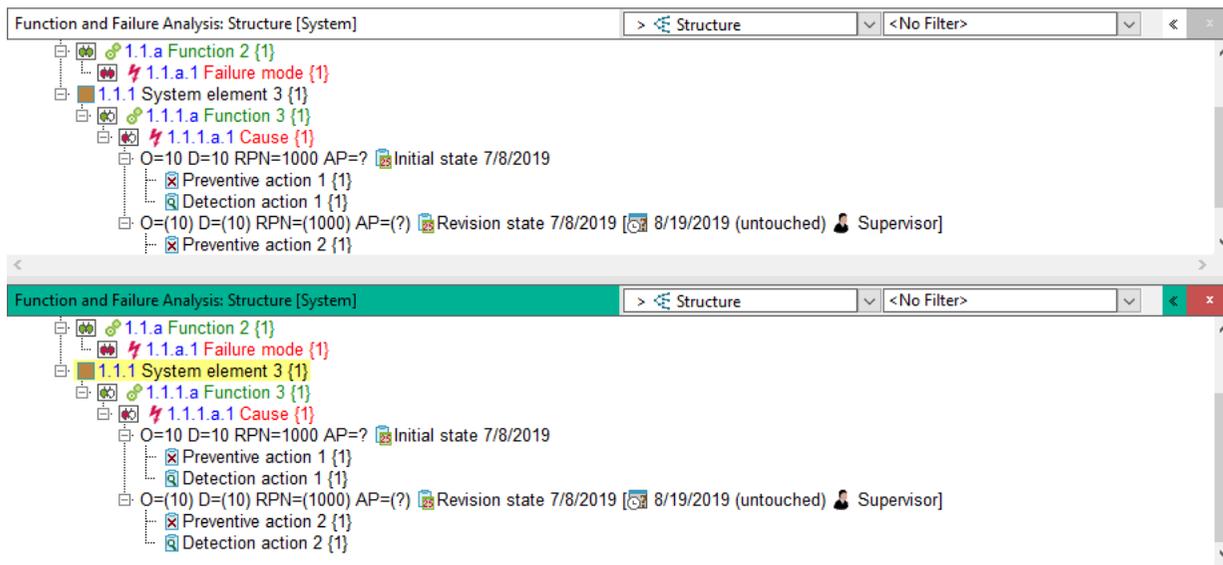
Picture: Input collector with catalog

If an entry was input by pressing the Enter key, the task pane includes additional possible actions, e.g. regarding variants and inheritance. It is also possible to change the object type, and this way enter functions, product and process characteristics at the same time.

Toolbars at the workspaces

The classical view includes up to three toolbars, which are displayed above the workspaces in the Personal Desktop. The actions always refer to the content of the active workspace.

The user now has the possibility to assign one of the three toolbars directly to the workspaces (menu: View | Toolbars | Headline workspace).



Picture: Two workspaces in the Personal Desktop, each with assigned third toolbar

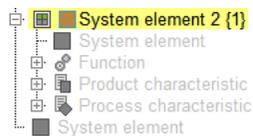
Auto complete support in Structure list and Function/Failure analysis

The auto complete technique, also known as full text search or auto completion list, could only be used in table editors so far. It is now also available in the Structure list and the Function/Failure analysis, e.g. via Ins key.

Extended input fields in Structure list and Function/Failure analysis

All potential dependent objects can be displayed in the Structure list and the Function/Failure analysis. This is done when performing a direct edit, e.g. via the Ins key. New objects can then be created by double clicking a potential object or pressing Enter.

You can choose to activate Direct insert: Activate extended input fields in the rubric General of the Workstation settings.

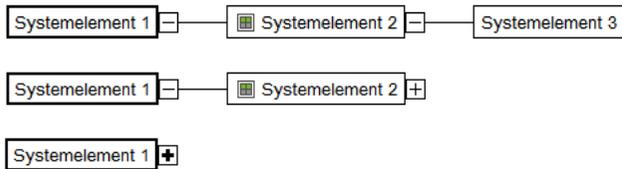


Picture: Extended input fields - View after pressing the Ins key on a system element

New folding operations

The Structure tree and net editors now use +/- symbols for folding. Clicking on them folds/unfolds the neighboring nodes in this direction.

Remark: The line width of the folding symbol shows whether one or more levels have been folded.



Picture: Folding symbols when folding one or more levels

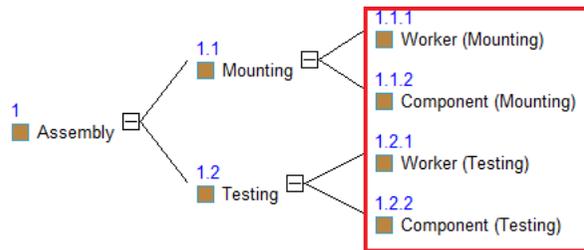
Create last structure level automatically

The FMEA method describes that e.g. in the field of Process FMEA the "5-M" (Man, Machine, ...) have to be considered as potential system elements for causes. For pragmatical reasons, the name of the process step is added to the name of the system element for causes quite often.

The editor **Attributes** and **categories** in the Data Manager now offers the possibility to define several **Naming** patterns with according system elements including placeholders.

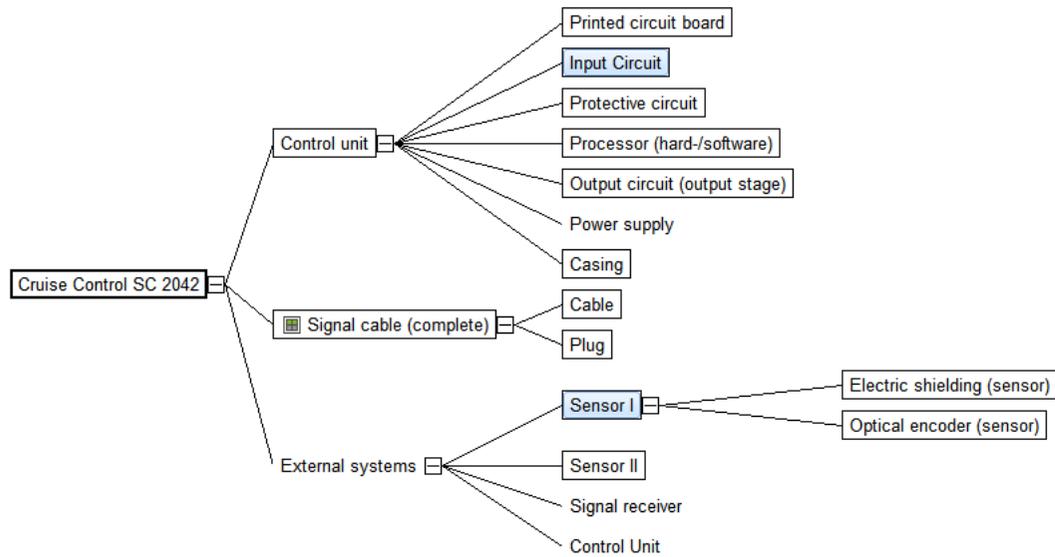
Naming pattern for system elements	System element
Process (default)	Worker (%SE%)
	Component (%SE%)

This makes it possible to create the last level of a structure by context menu command.

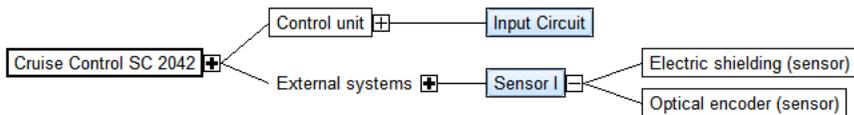


Focus in the Structure tree

When working in the Structure tree, apart from the established possibilities to fold and filter, now there is also the possibility to set a focus, known from working in the net editors. You can find the command **Make focus** in the right click menu. As an alternative you can also use the hot key **Ctrl+K**.



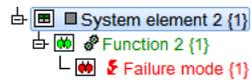
Picture: Structure tree with two selected system elements



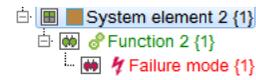
Picture: Structure tree with focus on the previously selected system elements

Context menu for Hot-click symbols

Via the Display options it is possible to show Hot-click symbols. In V6.5 and V7.0 the information e.g. in the Structure list is displayed as follows:



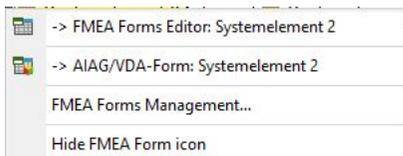
Picture: Structure list Version 6.5



Picture: Structure list Version 7.0

The behavior when executing a double click on one of these icons is unchanged in Version 7.0

But now there is also a context menu for these Hot-click symbols. A click with the right mouse button on one of them offers different options specific to the icon. The Hot-click context menu for the FMEA forms icon for example shows



Picture: Hot-click context menu FMEA forms icon

To open the regular context menu like in V6.5, you need to right-click on the name. The whole functionality can also be disabled via Workstation settings | Personal Desktop.

Background color for objects

So far it was possible to define a background color for the following objects:

- Structure variant
- System element
- Action group
- Categories for action groups

Now you can also choose a background color for:

- Structure
- Function
- Error detection, Error response, Operating condition
- Product characteristic, Process characteristic
- Requirement
- DRBFM Modification
- Failure
- Inspection
- Reaction plan, Control method
- Revision state, Action group, Categories for action groups
- Preventive action, Detection action
- FMEA form, Control Plan, Process Flow Diagram, DRBFM formsheet

So it is possible for example, to assign a background color to causes and maybe also effects in the FMEA form.

Process element: Insert plug into soldering appliance			
Function: plug body is in correct position and bearing in soldering appliance			
degree of waste is too high	7	plug-body is not placed correctly in soldering appliance	plug is being put laterally reversed into appliance
			plug is not properly positioned onto attachment points of the appliance
degree of waste is too high	7	plug body is damaged	plug is being put laterally reversed into appliance
modulation of signal changes during transmission within the given application conditions	9		appliance lock damages plug
Function: appliance is locked			
degree of waste is too high	7	plug is not locked in appliance	appliance lock is not closed properly
modulation of signal changes during transmission within the given application conditions	9		

Picture: FMEA form (extract) with background colors at effect and cause

The new Object Inspector

The previous Object Inspector has been reworked. Important innovations:

- Apart from the classical Object Inspector there is now also an editor Object Inspector (undocked).

- It is possible to inspect multiple selected objects and bring them into Matrix display.
- Possibility to show the displayed content as Reduced view in the undocked Object Inspector
- Enhancements for working with variants and multiple document languages (filtered views)

Name	Note	Miscellaneous	Action tracking	Valuation	References	Bookmark
<ul style="list-style-type: none"> • Detection action (1) • Preventive action (1) 						
Action tracking			<input checked="" type="checkbox"/> Detection action 2 {1}			<input checked="" type="checkbox"/> Preventive action 2 {1}
Responsible	Supervisor		<input checked="" type="checkbox"/>	Supervisor		<input checked="" type="checkbox"/>
Deadline	8/20/2019		<input checked="" type="checkbox"/>	8/20/2019		<input checked="" type="checkbox"/>
Symbolic deadline						
Status	untouched			untouched		
Degree of progress	0			0		
Description (English)						
Starting date						
Completion date						
E-mail send at						

Picture: Matrix display of selected actions

File Edit View Tools Help	
Reduced view	
<input checked="" type="checkbox"/> Detection action 2 {1}	->Name (English) Detection action 2
	Name (Deutsch) Entdeckungsmaßnahme 2
	Name (French) Mesure de détection 2
	Name (Italian) Provvedimento di rilevamento 2
<input checked="" type="checkbox"/> Preventive action 2 {1}	->Name (English) Preventive action 2
	Name (Deutsch) Vermeidungsmaßnahme 2
	Name (French) Mesure préventive 2
	Name (Italian) Provvedimento preventivo 2

Picture: Reduced view of selected actions

Hide empty rows in the Object Inspector

The Object Inspector now offers the additional option to hide empty rows.

System element: 1.1 System element 2 {1}	
Attribute name	Attribute value
Background colour	
ID number	
Is a process element	No
Item code	
Symbol for process flow diagram	<unknown>
User defined number	1.1

- > Object inspector edit
- Hide selected attribute
- > View
- Display options...

Picture: Context menu in the Object Inspector V6.5

Miscellaneous -> System element: 1.1 System element 2 {1}	
Back color	
ID number	
Item code	
Symbol for process flow diagram	<unknown>
User defined number	1.1

- View >
- Display options...
- Find... Strg+F
- Show empty rows
- Hide selected attribute
- Only show values in the current document language
- Only show values of the current document and reference language
- Show help column

Picture: Context menu in the Object Inspector V7.0

New structuring in Display options, Document and Workstation settings

Display options, e.g. FMEA form, Document and Workstation settings are now structured more clearly by topic.

Remark: There is still the possibility to work with a search pattern.

FMEA Form: Display options

< -> Display options FME

Enter text to find

OK Apply

Display options FMEA Form

- Entries
- Contextual Information
- Effects / Cause Levels
- Additional details
- Content of classification (C) column
- Colors
- Hot-click symbols
- Table
- Table columns
- Sort

Display options FMEA Form

Here you can specify, how the individual objects are to be displayed in the **FMEA Form**:

- which **Entries** are displayed.
- which **Contextual Information** are displayed.
- which additional options and settings should be considered

Picture: Display options FMEA form with optional entry of a search pattern

Zoom

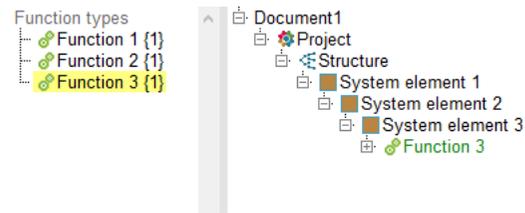
The Edit menu in the editors offers the Zoom functionality. The zoom grades are 50%, 70%, 100%, 150% und 200%. So far also zoom by mouse wheel was bound to these predefined zoom grades.

Zoom by mouse wheel can now be done in steps of 10% from 10% to 390%. Zooming is also supported in all editors now.

Catalogs - Details of instance count

The catalog shows the entries in form of a list. Via the context menu it was possible to open a dialog `Details of instance count`.

Now it is possible, like in the Structure list of the Structure editor, to show the hierarchical list for selected catalog entries side by side. The context menu also includes the command `Go to object` to go to an editor if necessary.

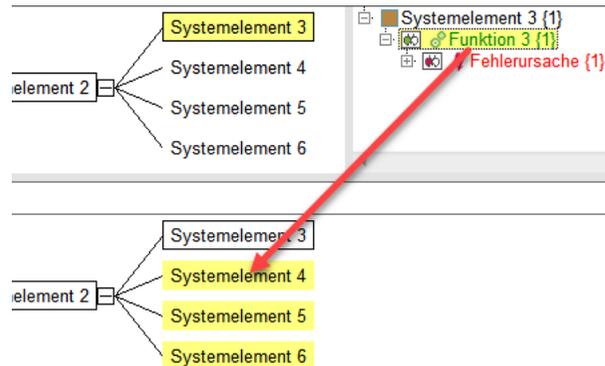


Picture: Catalog with Details of instance count in list view

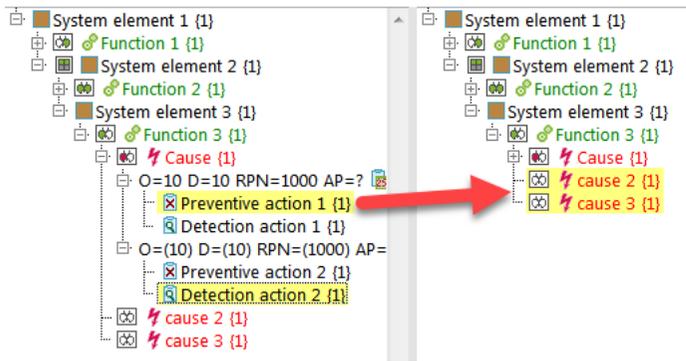
Multiple copying

Normal Drag&Drop moves or copies (pressed Ctrl key) objects to one (!) target. So far, Drag&Drop with the right mouse key (Special Drag&Drop) additionally supports several actions via the context menu. This also happens only in regards to one (!) target. It can be used e.g. to copy notes.

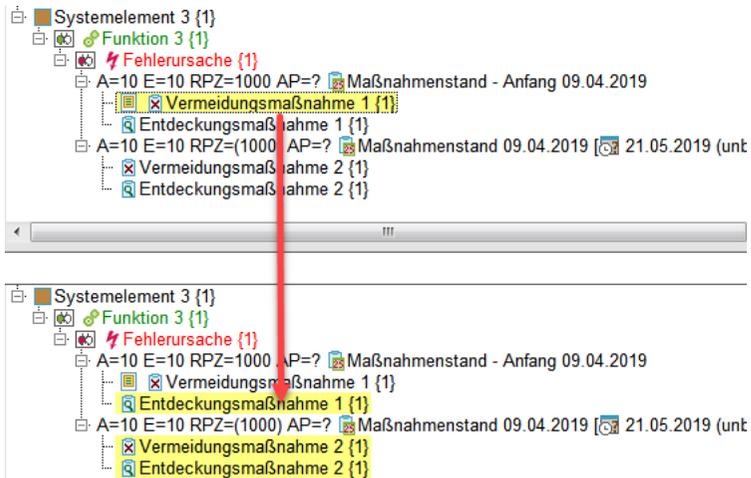
Now it is possible to transfer data to **multiple targets** using Special Drag&Drop. The target area has to be marked in advance.



Picture: Use Case - Assigning a function to multiple system elements



Picture: Use Case - Transferring actions; here to two failures



Picture: Use Case - Transferring of the object attribute "Note"; here to three actions.

Modularize structure subsequently

The context menu of system elements in the Structure tree now includes the feature `Extract into new structure`. This makes it possible to separate a complex structure tree into several structures.

Note: The newly created structure does not contain any variants.



This command extracts the selected system element and all of its dependent objects into a new structure. What remains is the empty system element with an object bookmark to the extracted system element.

All existing variant values of the extracted elements are deleted.

Structure spanning nets may be generated.
Continue?

Do not show this message again and remember user's choice

Yes

No

Picture: Info dialog during modularization

Activate Application components

The APIS IQ software includes functionalities, which may not be needed by every user. Therefore it is possible to **activate or deactivate application components** via `Tools | Workstation settings | Settings`.

The product type APIS IQ-RM Pro Version 6.5 offers the following options:

- Enable DRBFM
- Enable mechatronics FMEA
- Enable Customer Requirements Management

In Version 7.0, a separate rubric `Application components` was introduced in the `Workstation settings`. It includes the following options:

- Mechatronics FMEA
- Functional Safety - ISO 26262 / IEC 61508
- Design Verification Plan and Report (DVP&R)
- Customer Requirements Management
- Parts Functions Matrix
- Variants Transition Matrix
- Ishikawa Editors
- Design Review Based on Failure Mode (DRBFM)
- Fault Tree Analysis (FTA)
- Design for Six Sigma (DfSS)
- eXternal Data Integration (XDI) Interface

Note: If a functionality is deactivated, no data is lost in the FME files. Only the respective editors are no longer displayed in the `Editors` menu.

Computer based training / Learning units

The learning units which so far could be accessed via `Help | Open learning units` were removed.

Instead, videos about how to use the APIS IQ software were created. You can find these on www.apis-iq.com or on YouTube.

Conversion of process elements to system elements

In V7.0 the structure tree only includes system elements with their object attributes and dependent objects.

Previous (V6.5) process elements are automatically converted to system elements.

Action analysis and FMEA form

[Hot-click symbol for the Cover sheet](#)

[Create Cover sheet via header data](#)

[Simultaneous opening of multiple FMEA forms](#)

[New formsheet columns for S*O, O*D and S*D](#)

[Valuations in brackets](#)

[Filter criteria for action groups](#)

[Excel export with colors, symbols and graphics](#)

[Cascaded \(relative\) symbolic deadlines](#)

[RPN/AP calculation for Failure nets with 2 levels](#)

[Statistics- Icons for Analysis types](#)

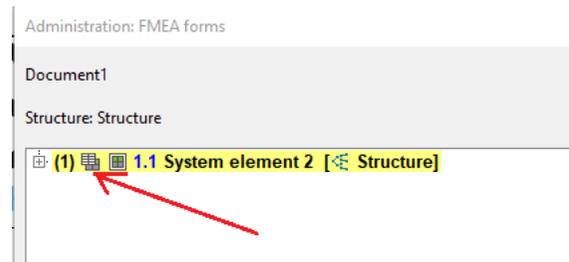
[Statistics with incompletely rated revision states](#)

[Assigning multiple classifications](#)

Hot-click symbol for the Cover sheet

The management dialogs FMEA Forms Management and Control Plan Management may now include a Cover sheet icon.

This can be used for hot-click, that means a double click on it opens the respective Cover sheet.



Picture: Hot-click icon „Cover sheet“ in the management dialog

Apart from the menu command Tools | Forms/Reports it is possible to use the context menu in the management dialogs to switch to the Cover sheet and thus create one.

Created Cover sheet via header data

The context menu (right click) in the header area of the FMEA form now includes the entry -> FMEA cover sheet. This can be used to create and open a Cover sheet.

Simultaneous opening of multiple FMEA forms

With the Document setting Enable opening of multiple FMEA forms it is possible to select several FMEA forms in the FMEA Forms Management and open these in one workspace.

So it may be possible to do without a possibly very large group form. Also contents can be displayed together in one view in a very flexible way.

You can find this Document setting in the rubric General.

New formsheet columns for S*O, O*D and S*D

Via the Display options additional columns for the result of the multiplication of S*O, O*D and S*D can be displayed in the FMEA form.

Preventive action	S*O	O
-------------------	-----	---

Initial state: 7/9/2019		
<input checked="" type="checkbox"/> Preventive action 1	100	10
Revision state: 7/9/2019		
<input checked="" type="checkbox"/> Preventive action 2	100	10

Picture: FMEA form – additional column S*O

When the display option Use colors for valuations is active, the background color will be displayed according to these parameters. You can find the respective display option in the FMEA form.



Picture: Dialog „Parameters for Color coding“

Valuations in brackets

To make it easier to recognise that a revision state is not completed yet, also O and/or D ratings will be displayed in brackets, if at least one of the actions is not completed.

Filter criteria for action groups

New additional filter criteria have been introduced for action groups. These can be used to determine degradations in O/D ratings or AP.

- Creation date is less than <unknown>
- Name of creating person contains <unknown>
- Modification date is greater than <unknown>
- Name of the last modifying person contains <unknown>
- Has actions equals true
- Degraded rating after reevaluation (D or O) equals true
- Degraded rating after reevaluation (AP) equals true
- Is an interface function or in its context equals true
- Variant-specific attributes are available equals true
- Finish the open action equals true
- IQ object ID contains *
- Back color equals <unknown>

Picture: Filter criteria action group level - Extended

Excel export with colors, symbols and graphics

Apart from general enhancements for the Excel export of table views (e.g. an FMEA form), colors, symbols and graphics can be exported as well now.

Preventive action	SxO	O	Detection action	D	RPN	RMR	R/D
Initial state: 11.04.2019							
Preventive action 1		4	Detection action 1	10	200		
Revision state: 11.04.2019							
Preventive aciton 2		2	Detection action 2	1	10		Responsible? Deadline? completed

Picture: APIS IQ Software - FMEA form (Extract) with color in cells

Preventive action	SxO	O	Detection action	D	RPN	RMR	R/D
Initial state: 11.04.2019							
Preventive action 1		4	Detection action 1	10	200		
Revision state: 11.04.2019							
Preventive aciton 2		2	Detection action 2	1	10		Responsible? Deadline? completed

Picture: MS Excel - FMEA form (Extract) in the exported XLSX file

Cascaded (relative) symbolic Deadlines

For the deadline of an action a symbolic deadline can be assigned. The accordant specific deadline can be defined or changed at a later time if necessary.

For projects with a sequence of deadlines a symbolic deadline can be collated to another symbolic deadline. That means, it is located one level deeper in the hierarchy.

Deadline changes on higher levels will then affect deadlines on the lower level.

The allocation and the reordering can be done via Edit | Reorder or Drag&Drop.

The display of the symbolic deadlines in the Data Manager is either with outline name or indent string.

Symbolic deadline	Specific deadline
Quality Gate A	01.01.2020
> Quality Gate B	15.01.2020
> > Quality Gate C	31.01.2020

Picture: Cascaded symbolic deadlines with indent string

RPN/AP calculation for Failure nets with 2 levels

For the calculation of the RPN/AP in the **Failure net** the S rating is taken from the first effect level. This way it is possible to calculate an RPN/AP also for failure nets with only two levels.

Note: So far the S rating has been taken from the next higher level.

Statistics - Icons for Analysis types

The icons for the different analysis types which were partly located in the toolbar, have been moved to the extended toolbar now. Also an icon for the new analysis type Frequency analysis AP has been added.



Picture: Statistics editor with three toolbars

Statistics with incompletely rated revision states

With a **Document setting** it is possible to decide that statistics now also take failures into account, where a complete rating with S, O and D is missing. This can only work if a complete rating is not necessary for the respective analysis. A Risk matrix SxO for example can also take into account failures without D rating.

You can find the respective document setting **Statistics: Allow evaluation of not fully rated revision states** in the rubric General.

Assigning multiple classifications

With a **Document setting** the rubric **Classification** in the Properties dialog can be changed so that more than one classification can be assigned.

-  FIT/FUNCTION
-  PENTAGON
-  SAFETY/COMPLIANCE
-  CRITICAL CHARACTERISTIC
-  SHIELD
-  HEXAGON
- SC** SIGNIFICANT CHARACTERISTIC
- CC** CRITICAL CHARACTERISTIC
- YS** POTENTIAL SIGNIFICANT CHARACTERISTIC
- YC** POTENTIAL CRITICAL CHARACTERISTIC

Picture: Dialog (Partial view) klassifikation, if the setting for multiple classifications is active.

You can find the respective document setting `Enable assignment of multiple classifications` in the rubric `Classification`.

Generate operating figures of the FMEA

[Management Report Editor](#)

[Summary Function](#)

Management Report Editor

With the Management Report (Menu command `Tools | Forms/Reports`) you can create and manage regular status reports. In predefined areas, the user can define the appearance of the report. With the help of filters, quality rules and place holders certain operating figures can be determined and maintained automatically.

Feldnamen	Wert
AP=H:	46
AP=L:	41
AP=M:	21
Offene Termine:	17
Terminüberschreitungen (alle Verantwortliche):	17

Picture: Example for Management Report

Using a special template, the user can create a report, which summarizes the results of the analysis. This summary can be used for documentation purposes.

Reifegradbewertung der FMEA mit Qualitätsregeln			
Qualitätsregel	Wert (Treffer)	Wert (Alle)	Wert (%)
Fehlfunktionen ohne Folgen und Ursachen	36	213	16,9014085
Offene Maßnahmen	75	291	25,7731959
Maßnahmen ohne Verantwortlichkeit und Termin	1	81	1,2345679
Maßnahmen mit Terminüberschreitung	68	291	23,3676976

Picture: Example for Management Report with calculated percentage and automatically assigned background color

Reports can be saved in versions, and also can be ex- and imported. If necessary, reports can be compared as well.

Tabellenvergleich: Monatsbericht Version 1 => Monatsbericht Version 2
Unterschiede: 14 => 14
 Unterschiede farblich hervorheben

Monatsbericht zum FMEA-Status

Mit dem nachfolgenden Bericht erhalten Sie monatlich den Status der wesentlichen Kenngrößen aus der FM

Die verwendeten Kenngrößen bestimmen sich aus den folgenden internen Richtlinien:

- INT 10
- INT 50

Einfache Platzhalter

Ausgewerte FMEA: RG 2042 Signalkabel herstellen
Datum der Auswertung: 25.04.2019

Reifegradbewertung der FMEA mit Qualitätsregeln

Qualitätsregel	Wert (Treffer)	Wert (Alle)
Fehlfunktionen ohne Folgen und Ursachen	6	50
Offene Maßnahmen	17	110
Maßnahmen ohne Verantwortlichkeit und Termin	1	18
Maßnahmen mit Terminüberschreitung	17	110

Platzhalter mit Arithmetik

Anteil an noch "offenen" Maßnahmen: 16,18 %

Platzhalter mit Filterpaket

AP=H: 46
AP=L: 41
AP=M: 21
Offene Termine: 17

Monatsbericht zum FMEA-Status

Mit dem nachfolgenden Bericht erhalten Sie monatlich den Status der wesentlichen Kenngrößen aus der FM

Die verwendeten Kenngrößen bestimmen sich aus den folgenden internen Richtlinien:

- INT 10
- INT 50

Einfache Platzhalter

Ausgewerte FMEA: RG 2042 Signalkabel herstellen
Datum der Auswertung: 25.04.2019

Reifegradbewertung der FMEA mit Qualitätsregeln

Qualitätsregel	Wert (Treffer)	Wert (Alle)
Fehlfunktionen ohne Folgen und Ursachen	6	39
Offene Maßnahmen	17	73
Maßnahmen ohne Verantwortlichkeit und Termin	1	18
Maßnahmen mit Terminüberschreitung	17	73

Platzhalter mit Arithmetik

Anteil an noch "offenen" Maßnahmen: 22,67 %

Platzhalter mit Filterpaket

AP=H: 33
AP=L: 32
AP=M: 14
Offene Termine: 17

Picture: Comparison of Management Report examples including highlight of the differences

Summary Function

The functionality Summary Function makes it possible to determine operating figures and is based on the filter concept. Summary Functions can be used e.g. by text template in notes or in the PIM as individual Quality Report (IQR).

Apart from the dynamic placeholders it is also possible to save the operating figures permanently with the values they had when the analysis was executed. For this a conversion to static information is necessary. To do this either change the "%" at the placeholder to "%%" manually or use the context menu of selected information.

Platzhalter für einfache Kennzahlen:

AP=H: [50](#)

AP=L: [41](#)

AP=M: [17](#)

Offene Termine: [17](#)

Terminüberschreitungen (alle Verantwortliche): [17](#)

Platzhalter für arithmetische Kennzahlen:

Anteil an offenen Maßnahmen: [15,18 %](#)

Picture: Calculation of dynamic operating figures by Summary Function

The functionality Summary Function which was already available in V6.5 was optimized in details. For example counted results (from filters) can include a link, which refers to the IQ Explorer and starts a search with the filter behind. So the result list which leads to the counted results becomes visible.

New settings

[Fonts and colors / selection color](#)

[Transfer settings to a different workstation](#)

[Management for user information](#)

Fonts and colors / Selection color

The topic Fonts and colors has been reworked.

The IQ software now includes e.g. a separate selection color which does not depend on the selection color of Windows. The predefined default value of yellow can be changed if necessary.

Transfer settings to a different workstation

With the TPL file (= TemPLate file) settings can be transferred from one workstation to another (Menu command `Workstation settings | Settings | System optimization | Other`).

Management for user information

User information dialogs, which are displayed from time to time, can be deactivated by the user, storing the user's choice if applicable. These dialogs can be "reactivated" via `Tools | Workstation settings | Reactivate user information`. Additionally there is now also the possibility to manage the deactivated dialogs and user choices (Menu command `Tools | Workstation settings | Manage user information`).

Remark: The dialog `Manage user information` shows context information, the text of the information dialog and the user's choice in form of a table.

Adopt and check data

[Quality rules](#)

[Audit Trail](#)

[Innovations for filters](#)

Quality rules

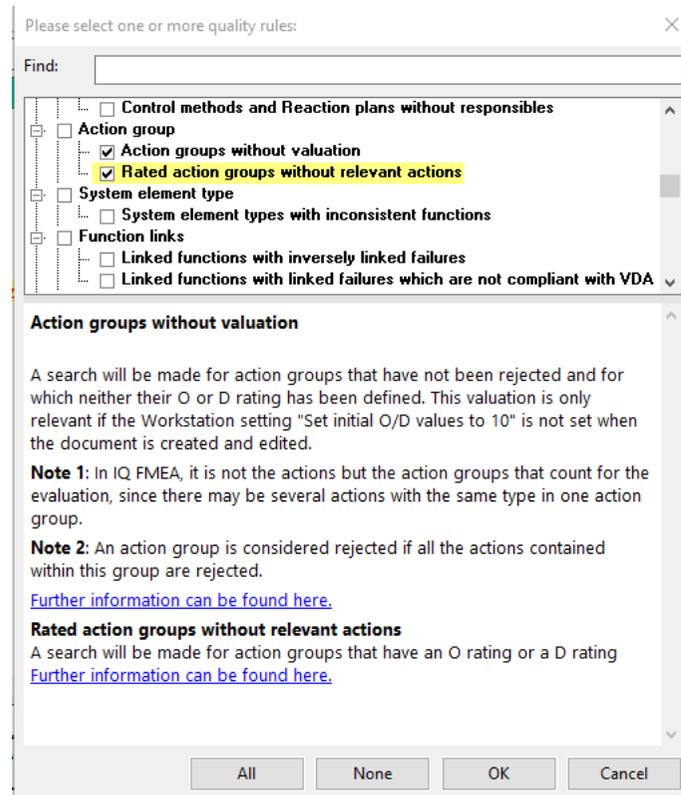
Quality rules are an additional concept to determine the degree of maturity of an FMEA and find abnormalities. The needed rules can be selected from a catalog with predefined rules. In contrast to the Assistant rules it is not intended that the user creates new rules.

Quality rules can be used in the following editors:

- Management Report
- Function/Failure analysis (FFA)
- IQ Explorer

Use the suggestion list and select the Quality Rules command which opens a dialog to select the specific quality rules.

After highlighting or finding objects which match the quality rule, further steps can be taken, e.g. open in Object Inspector or Go to Next Highlighted.



Picture: Selection dialog quality rules

Audit Trail

The product flavors APIS IQ-FMEA PRO and APIS IQ-RM PRO include functionalities, which are related to the regulated environment of medicinal technology (GxP). The following four requirements for computer-aided systems (here IQ software) have to be fulfilled:

1. **Defined access:** Access is only possible for authorized persons. The assigned role provides the permissions for write access.
2. **Computer generated change log (so called Audit Trail):** With reasons and signature: Who did which changes, when, where and why?
3. **Archiving of all revision states including version control:** Only released changes are possible and approved. Only checked out working copies can be edited. Each working copy is converted to a documentation version, which only allows Read only access.
4. **Electronic approval procedure for documentation versions:** With electronic signatures (Who including role, date and time)

This functionality is called Audit Trail in the IQ software. It can be activated via the Document settings and should be combined with log in via an LDAP server.

Administrator settings for the current document

Changes here can only be made by the supervisor or administrator.

Use LDAP server for user login

Only persons who have been imported from the LDAP Interface can log on to the IQ software. When registering a person in the IQ software the authentication will be verified over the LDAP Interface.

Note: It is necessary to be connected to an LDAP-Server to be logged on.

Activate Audit Trail

The Audit-Trail is used to track changes within an fme file. If the Audit-Trail is activated, the following additional save commands will be available:

1. Command "Save with Signature"
2. Command "Save with Approval"

Picture: Document settings - Administration

After the activation it is possible to log changes via an approval process for the current fme file. This way small and big versions of an FMEA can be generated, which either pass through only a part of or the whole procedure. And also the further workflow is supported.

Inovations for filters

System filters are now displayed ordered in topics. This makes it easier to find the needed filters.

- [-] System-defined filters
 - [-] Actions
 - Open deadlines
 - Open deadlines of the current user
 - Future deadlines
 - Deadlines overdue (all responsables)
 - Actions without deadlines (without symbolic)
 - Improved actions (finished)
 - [-] Methodology
 - Not completely connected failure net [p]
 - Function/requirements net not continuously linked [p]
 - [-] Top risk
 - The top 10 failures (last rated revision state) [p]
 - The top 10 failures (initial state) [p]
 - The top 10 failures (last completed revision state) [p]
 - Actions with maximum RPN or date in the future [p]
 - [-] Modifications
 - Changes of structure version [p]
 - Creation or modification date (stamp) [p]
 - [-] Structure variants
 - All objects with inclusion attribute

Picture: System filters with outline

Further innovations:

- For working with multiple notes categories the selection of relevant notes categories has been simplified.
 - There are additional system-defined filters, e.g. with the criterion "Not continuously linked Failure/Function net".
 - The FMEA form includes additional parametrizable system-defined filters with the criteria maximum RPN or Date in the future.
-

Translate

[DeepL Pro integration of the translation service](#)

[Single projects/structures in terminology control](#)

DeepL Pro integration of the translation service

The translation service DeepL Pro, which evolved from Linguee, is a well known provider for professional, software based translation.

The Workstation settings now offer the possibility to enter an authentication key for DeepL. So it is possible to automatically translate selected objects, e.g. in Terminology and translation (Menu command Edit | Translate (de -> en)).

Further information about DeepL Pro can be found under <https://www.deepl.com/pro.html>

Single projects/structures in terminology control

With multiple projects/structures in an FME file it may be wise to see only objects with instances in certain projects/structures in Terminology and translation.

There is now the menu command View | Limit to projects/structures.

Note: When closing Terminology and translation this restriction will be reset.

AIAG/VDA FMEA Handbook (2019)

[FMEA scope analysis](#)

[Structure type AIAG/VDA MSR \(2019\)](#)

[Action Priority catalog](#)

[Statistics by AP](#)

[Valuation catalogs](#)

[Embedding of diagrams \(e.g. Boundary diagram\)](#)

[P-Diagram](#)

[AIAG/VDA form](#)

FMEA scope analysis

Step 1 - **Planning and preparation** described in the method part of the AIAG & VDA FMEA Handbook (2019) is supported by the new editor FMEA scope analysis. In a selection matrix it is possible to assign different valuation criteria.

The criteria to be used are provided by structure type and are based on the entries in the administration editor Valuation criteria (FMEA scope) (Menu command Administration | Attributes and categories). They can be deselected individually and also their order can be changed.

It is possible to select already existing system elements of a structure, but also to create new system elements directly in the editor.

System element	Reference product or process	Information source	Valuation Criteria (FMEA Scope)				Risk potential
			Criterion A	Criterion B	Criterion C	Criterion D	
■ Casing {1}			X	X			Yes
■ Push button {1}					X		Yes
■ Lead {1}				X		X	Yes
■ Spring {1}							No

Picture: Editor FMEA scope analysis (Default)

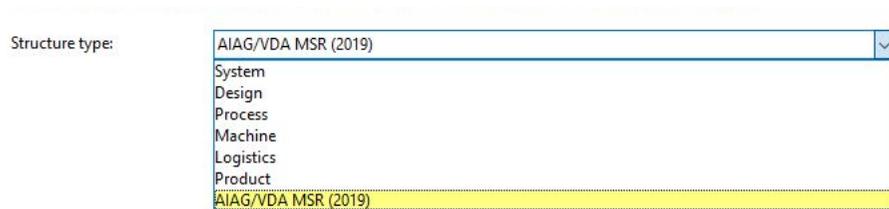
System element	Reference product or process	Information source	Valuation Criteria (FMEA Scope)				Risk potential	Ranking
			Criterion A	Criterion B	Criterion C	Criterion D		
■ Casing {1}			1	5			6	3
■ Push button {1}					7		7	2
■ Lead {1}				3		9	12	1
■ Spring {1}								4

Picture: Editor FMEA scope analysis (Complex)

It is possible to enter further information, e.g. Notes or link to a reference FMEA.

Structure type AIAG/VDA MSR (2019)

The AIAG & VDA FMEA Handbook (2019) introduces the new FMEA type **FMEA for monitoring and system response (MSR)**. This is available as the new structure type AIAG/VDA MSR (2019) in the IQ software.



Picture: selection list Structure type

Action Priority catalog

According to the methodology described in the AIAG & VDA FMEA Handbook (2019), catalogs for the Action Priority (AP) for DFMEA, PFMEA and FMEA-MSR have been implemented (Menu command Administration | AP catalogs).

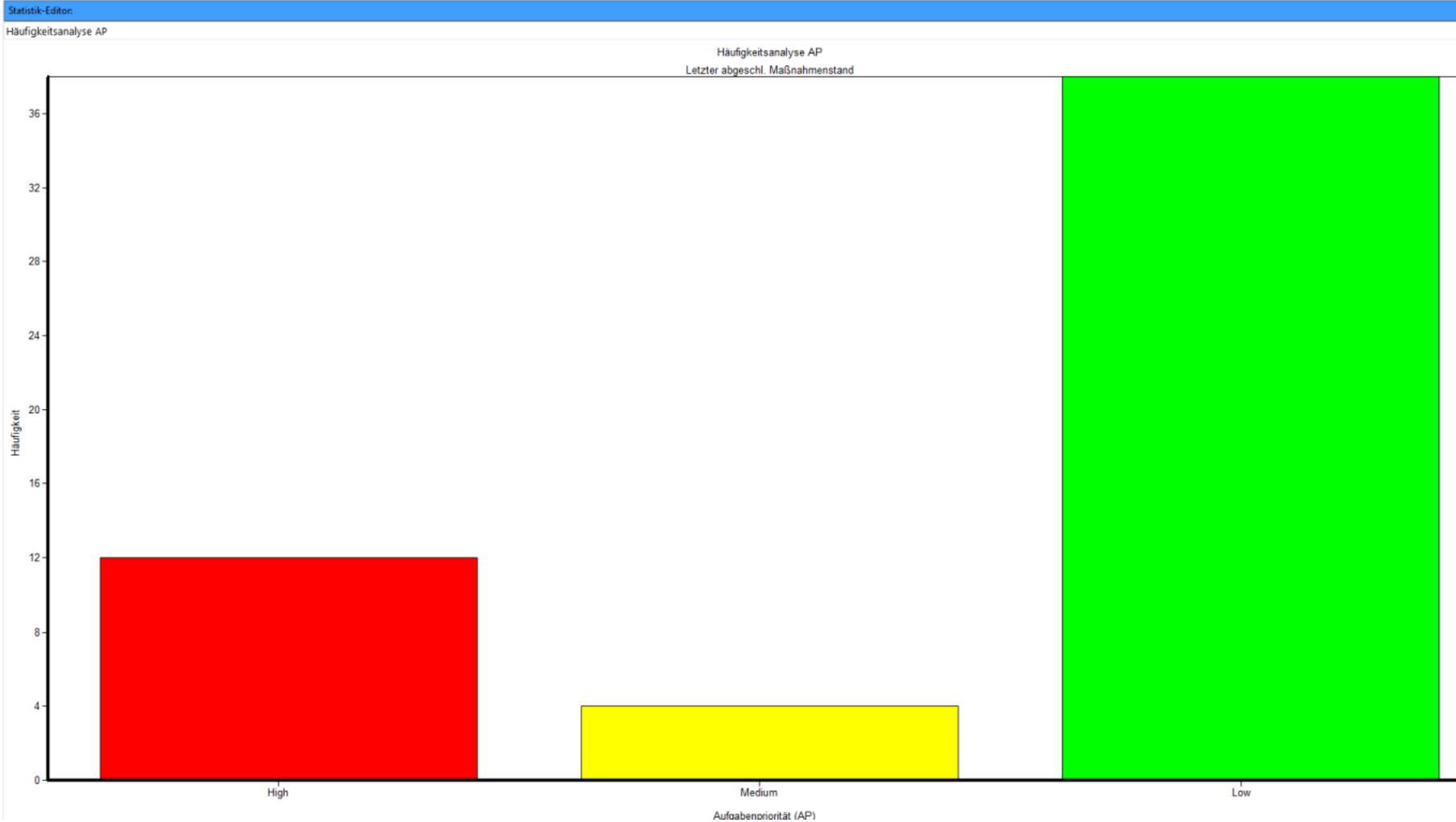
Catalog	Effect	S	Prediction of Failure Cause Occurring	O	Ability to Detect	D	AP
AIAG/VDA Design/Process (2019)	Product or Plant Effect Very high	9 - 10	Very high	8 - 10	Low - Very low	7 - 10	H
					Moderate	5 - 6	H
					High	2 - 4	H
					Very high	1 - 1	H
			High	6 - 7	Low - Very low	7 - 10	H
					Moderate	5 - 6	H
					High	2 - 4	H
			Moderate	4 - 5	Very high	1 - 1	H
					Low - Very low	7 - 10	H
					Moderate	5 - 6	H
			Low	2 - 3	High	2 - 4	H
					Very high	1 - 1	M
					Low - Very low	7 - 10	H
					Moderate	5 - 6	M
			Very low	1 - 1	High	2 - 4	L
					Very high	1 - 1	L
Very high - Very low	1 - 10	L					

Picture: Dialog AP catalog (Extract)

Like with other valuation catalogs it is also possible to create more, own AP catalogs and manage them.

Statistics by AP

For the newly implemented Action Priority (AP) also corresponding statistics were integrated.



Picture: Frequens analysis AP

Valuation catalogs

According to the methodology described in the AIAG & VDA FMEA Handbook (2019) two additional valuation catalogs for Severity (S), Occurrence (O) and Detection (D) have been integrated:

- AIAG/VDA (2019) DFMEA
- AIAG/VDA (2019) PFMEA

Additionally for FMEA-MSR there is the valuation catalog for Severity (S), Frequency (F) and Monitoring (M):

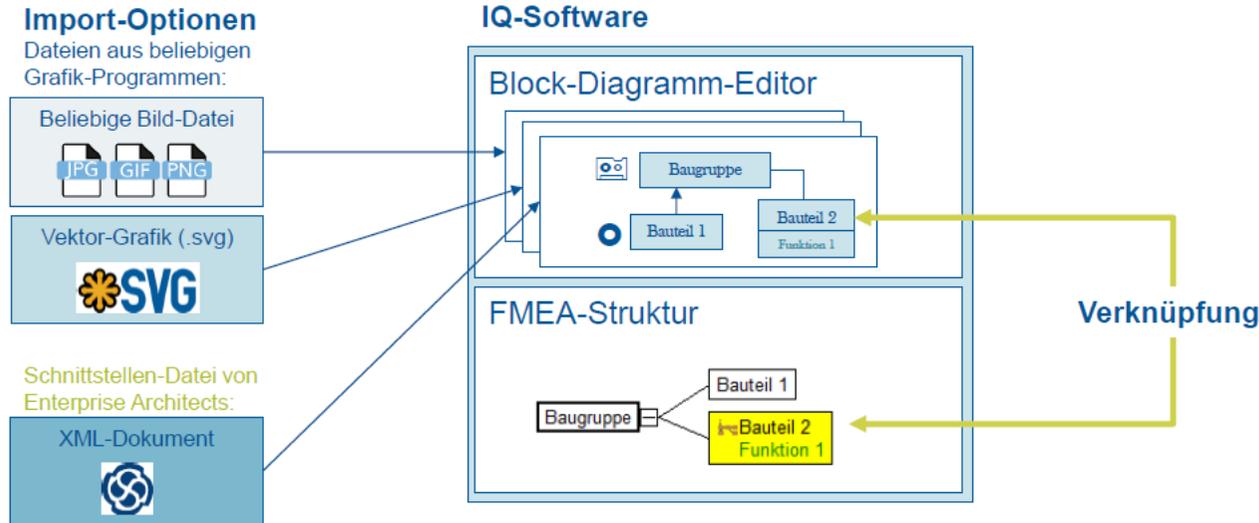
- AIAG/VDA (2019) FMEA-MSR

Note: In connection with FMEA-MSR the usage of Frequency (F) instead of Occurrence (O) and Monitoring (M) instead of Detection (D) may lead to problems, especially with a more global thinking. E.g. in statistics or in the labels in some tables the Occurrence (O) also includes the "renamed" Frequency (F) and the same goes for Detection (D) and Monitoring (M).

Embedding of Diagrams (e.g. Boundary Diagram)

The Block Diagram editor offers the user the possibility to import graphics from different sources.

In the graphics, areas can be defined and assigned to IQ objects. This way a bidirectional link is created, so that it is possible to synchronize from the graphic to the IQ object and vice versa.

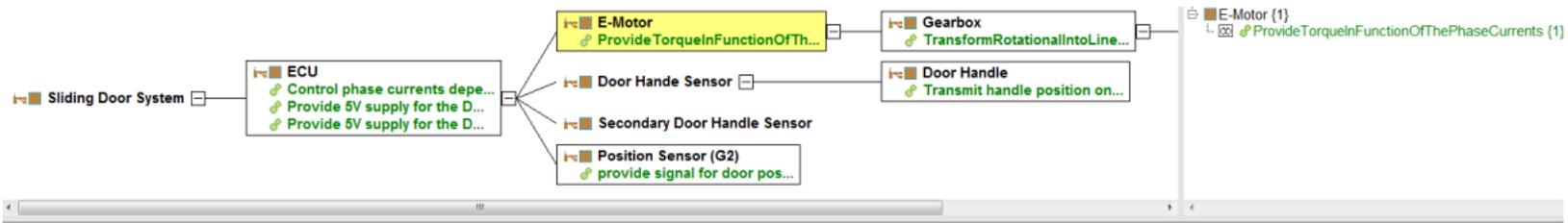


Picture: Import options for the Block Diagram editor

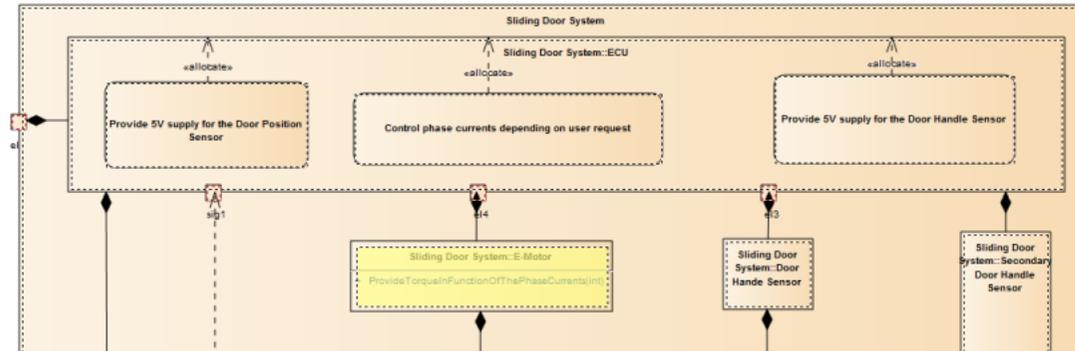
It is not necessary to manually define areas and link them to IQ objects if the imported files already contain the respective information. Using these kind of data formats (.svg or .xml) the areas, objects and links are created automatically and can be adjusted afterwards.

The Block Diagram editor contains an administration dialog to manage all block diagrams in an .fme file and create versions of them.

Remark: The company LieberLieber wrote a connector for Enterprise Architect (EA) that allows to export diagrams as well as system elements and functions / product characteristics into an .xml file that can be opened in IQ software. If you are interested in this connector, please contact sales@apis.de



Block-Diagramm-Editor: SlidingDoor StructuralView.svg

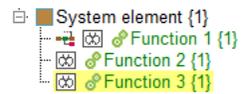


Picture: Block Diagram with automatically created structure

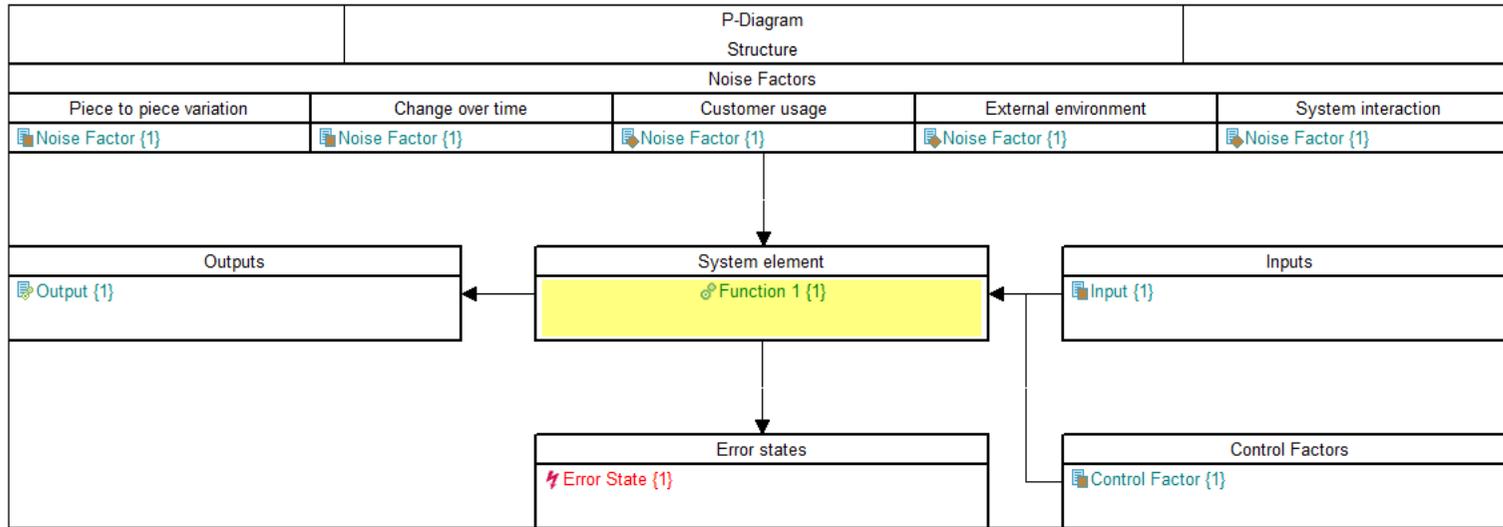
P-Diagram

The Parameter-Diagram (Editor: P-Diagram) focusses on a function and makes it possible to enter according information like:

- Input
- Output
- Error states
- Control Factors
- Noise Factors (in predefined categories)



Picture: „Function 1“ with Hot-click symbol for the P-Diagram



Picture: P-Diagram (Example)

Remark: There are several layouts for the P-Diagram the user can choose from.

The available Noise Factor categories can be adapted to your needs in the Data Manager (Menu command Administration | Attributes and categories).

AIAG/VDA Form

According to the methodology described in the AIAG & VDA FMEA Handbook (2019) new FMEA Forms were implemented.

The new AIAG/VDA Forms editor at first shows all information in columns side by side.

STRUCTURE ANALYSIS (STEP 2)						FUNCTION ANALYSIS (STEP 3)			FAILURE ANALYSIS (STEP 4)						RISK ANALYSIS (STEP 5)												
1. Process Item System, Subsystem, Part Element or Name of Process		2. Process Step Station No. and Name of Focus Element		3. Process Work Element 4M Type		1. Function of the Process Item Function of System, Subsystem, Part Element or Process	2. Function of the Process Step and Product Characteristic (Quantitative value is optional)		3. Function of the Process Work Element and Process Characteristic		1. Failure Effects (FE)		S	SC	2. Failure Mode (FM) of the Process Step		3. Failure Cause (FC) of the Work Element		Current Prevention Control (PC) of FC		O	Current Detection Controls (DC) of FC or FM		D	AP	SC	Preventive Action
PLANNING and PREPARATION (STEP 1)												Subject:		Project													
Company Name:												PFMEA Start Date:		04.07.2019													
Plant Location:												PFMEA Revision Date:		04.07.2019													
Customer Name:												Cross-Functional Team:															
Model Year(s)/Platform(s):						System element 2																					
1. Process Item System, Subsystem, Part Element or Name of Process		2. Process Step Station No. and Name of Focus Element		3. Process Work Element 4M Type		1. Function of the Process Item Function of System, Subsystem, Part Element or Process	2. Function of the Process Step and Product Characteristic (Quantitative value is optional)		3. Function of the Process Work Element and Process Characteristic		1. Failure Effects (FE)		S	SC	2. Failure Mode (FM) of the Process Step		3. Failure Cause (FC) of the Work Element		Current Prevention Control (PC) of FC		O	Current Detection Controls (DC) of FC or FM		D	AP	SC	Prevention
1 {1} System element 1		1.1 {1} System element 2		1.1.1 {1} System element 3		1.a {1} Function 1	1.1.a {1} Function 2		1.1.1.a {1} Function 3		1.a.1 {1} S=10 Effect		10	Classification	1.1.a.1 {1} Failure mode		1.1.1.a.1 {1} Cause		{1} Preventive action 1		10	{1} Detection action 1		10	H	Classification	{1} 08.2019 (scheduled) [P] ve action

Picture: AIAG/VDA Form

The number of columns can be reduced, if you switch to the "stacked view". In this view system elements and functions for the three levels are positioned separately on top.

AIAG/VDA-Formblatt-Editor: System element 2																	
FAILURE ANALYSIS (STEP 4)						RISK ANALYSIS (STEP 5)						OPTIMIZATION (STEP 6)					
1. Failure Effects (FE)	S	SC	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	O	Current Detection Controls (DC) of FC or FM	D	AP	SC	Prevention Action	Detection Action	Responsible Person's Name	Target Completion Date	Status	Action Taken with Pointer to Evidence	Comple
PLANNING and PREPARATION (STEP 1)																	
Company Name:						Subject:			Project			PFMEA ID Number:					
Plant Location:						PFMEA Start Date:			04.07.2019			Process Responsibility:					
Customer Name:						PFMEA Revision Date:			04.07.2019			Confidentiality Level:					
Model Year(s)/Platform(s): System element 2						Cross-Functional Team:											
1. Failure Effects (FE)	S	SC	2. Failure Mode (FM) of the Process Step	3. Failure Cause (FC) of the Work Element	Current Prevention Control (PC) of FC	O	Current Detection Controls (DC) of FC or FM	D	AP	SC	Prevention Action	Detection Action	Responsible Person's Name	Target Completion Date	Status	Action Taken with Pointer to Evidence	Comple
1 {1} System element 1						1.1 {1} 2. Process Step Station No. and Name of Focus Element: System element 2						1.1.1 {1} System element 3					
1.a {1} Function 1						1.1.a {1} 2. Function of the Process Step and Product Characteristic (Quantitative value is optional): Function 2						1.1.1.a {1} Function 3					
1.a.1 {1} B=10 Effect	10	Klassifikation	1.1.a.1 {1} Failure mode	1.1.1.a.1 {1} Cause	{1} Preventive action 1	10	{1} Detection action 1	10	H	Klassifikation	{1} 15.08.2019 (untouched) Supervisor Preventive action 2	{1} 15.08.2019 (untouched) Supervisor Detection action 2	Supervisor	15.08.2019	untouched	Ergebnis der Maßnahmen (Deutsch)	Fertigstellung

Picture: AIAG/VDA Form - stacked view

These options enable the user to execute the AIAG/VDA steps 2 to 6.

The other layouts described in the method of AIAG/VDA 2019 in the Annex A will be integrated if required.

As a simple and pragmatic solution, the previous, proven VDA96/06 layout was also adapted and a new layout AIAG/VDA 2019 has been integrated into the existing FMEA Form editor. This layout can be activated via menu command View | Format | Layout in the editor.

Company Name:				Subject: Project				Page:			
Plant Location:				PFMEA Start Date: 04.07.2019				PFMEA ID Number:			
Customer Name:				PFMEA Revision Date: 04.07.2019				Process Responsibility:			
Model Year(s)/Platform(s): System element 2				Cross-Functional Team:				Confidentiality Level:			
Effect	S	C	Failure mode	Cause	Preventive action	O	Detection action	D	AP	R/D	
System element: System element 2											
Function: Function 2											
[System element 1] Effect	10		Failure mode	[System element 3] Cause	Initial state: 04.07.2019						
					Preventive action 1	10	Detection action 1	10	H		
Revision state: 04.07.2019											
					Preventive action 2	(10)	Detection action 2	(10)	(H)	Supervisor	15.08.2019 untouched

Picture: FMEA Forms editor with AIAG/VDA 2019 layout

All information included in the AIAG/VDA form can also be shown if necessary. The activation can be done via the Display options as usual.

Company Name:			Subject: Project			Page:			
Plant Location:			PFMEA Start Date: 04.07.2019			PFMEA ID Number:			
Customer Name:			PFMEA Revision Date: 04.07.2019			Process Responsibility:			
Model Year(s)/Platform(s): System element 2			Cross-Functional Team:			Confidentiality Level:			
Effect	S	C	Failure mode	Cause	Preventive action	O	Detection action	D AP R/D	
System element: System element 2 {1}									
Function: Function 2 {1}									
[System element 1] <Function 1> 1.a.1 Effect {1}	10		1.1.a.1 Failure mode {1}	[System element 3] <Function 3> 1.1.1.a.1 Cause {1}	Initial state: 04.07.2019 Preventive action 1 {1} 10 Detection action 1 {1} 10 H				
					Revision state: 04.07.2019 Preventive action 2 {1} (10) Detection action 2 {1} (10) (H) Supervisor 15.08.2019 untouched				

Picture: FMEA Forms editor with AIAG/VDA 2019 layout with extended Display options

Note: The AIAG/VDA steps 2 and 3 can then be executed in the proven or also in new editors, especially Structure and Function net editor.

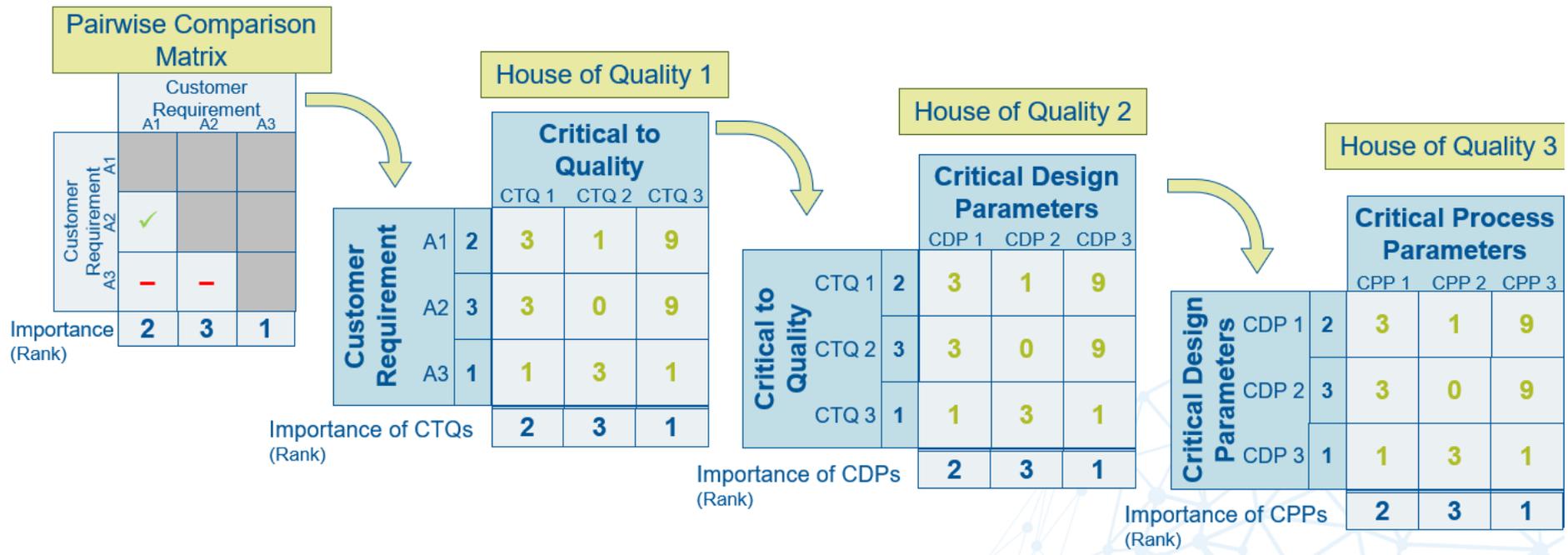
Six Sigma tools

The Six Sigma tools are included in the product flavors APIS IQ-FMEA PRO and APIS IQ-RM PRO. They support the concept **Design for Six Sigma (DfSS)**.

The available editors are Pairwise Comparison Matrix (PWC-Matrix) and House of Quality 1-3 (HoQ). Customer requirements which were already entered in the Customer Requirements Management can be contrasted with the first CTQ characteristics in the PWC Matrix.

- Pairwise Comparison Matrix
- House of Quality 1 (customer requirements/CTQ)
- House of Quality 2 (CTQ/CDP)
- House of Quality 3 (CDP/PPP)

Picture: Additional editors with activated Six Sigma tools



Picture: Six Sigma tools – support towards Robust Design

[Pairwise Comparison Matrix](#)

[House of Quality](#)

Pairwise Comparison Matrix

The editor Pairwise Comparison Matrix is one of the editors supporting **Design for Six Sigma (DfSS)**. Per default it is inactive. Like other application components it can be activated via Workstation Settings | Settings | Application components.

The editor allows to compare customer requirements to each other by selecting "Important" or "Less important".

Pairwise Comparison Matrix			
Document1			
Customer requirement	1 Requirement 1 {1}	2 Requirement 2 {1}	3 Requirement 3 {1}
1 Requirement 1 {1}			
2 Requirement 2 {1}	✓		
3 Requirement 3 {1}	-	-	
Total	1	0	2
Importance Rating	1	1	2

Picture: Pairwise Comparison with three customer requirements

House of Quality

In the HoQ editors (House of Quality), CTQ characteristics (Critical to Quality) are followed by CDP characteristics (Critical Design Parameters), which lead to CPP characteristics (Critical Process Parameters). All of these are contrasted with one another and prioritized.

Possible entries for prioritization are:

0 = no correlation

1 = low/suspected correlation

3 = medium correlation

9 = high correlation

If the Six Sigma tools are activated, the tab **Attributes** in the characteristics **Properties** dialog includes the option to decide, whether a characteristic shall be classified as CTQ, DCP or CPP characteristic. The respectively classified product characteristics are then available for HoQ1, HoQ2 or HoQ3. You can also create new characteristics directly in the HoQ editors.

Number of 's	Customer requirement	Importance Rating	PM 1	PM 2	PM 3	PM 5
1	Req 1	1	1	3		9
0	Req 2	1		3	3	
Raw Score			1	6	3	9
Relative Score			5%	32%	16%	47%
Importance Rank			1	4	2	5
Target Values						
Technical Difficulty						

Picture: HoQ 1 – Customer requirements / CTQ

Further editors

[Design Verification Plan and Report \(DVP&R\)](#)

Design Verification Plan and Report (DVP&R)

If the functionality DVP&R has been activated in the Workstation setting, the following additional features are available:

- The DVP&R editor is available in the **Editors** menu.
- Like the FMEA Form the DVP&R has its own management. (Menu command **Administration | DVP&R Management**). **Remark:** In the previous version DVP&Rs were not saved as named and managed objects with their own header data.
- The **Properties** dialog of preventive and detection actions includes the **Attribute** To be included in DVPR. For detection action this attribute is active by default. So detection actions will be displayed automatically in the **Test name** column in the DVP&R.

Design Verification Plan and Report: System element 3 (System element 3 (Structure [Process]))						
System element	Test name	Test number	Test method	Acceptance criteria	Test location	Sample size
1.1.1 System element 3 {1}	Detection action 1 {1}					
	Detection action 2 {1}					

Bild: DVP&R-Formblatt (Auszug)

Tests which are created directly in the DVP&R, will be added to the structure as detection actions.

Miscellaneous

[Command-Line Bookmarks](#)

[Palette representations based on previously selected representation](#)

[Customer Requirements Management](#)

[Presentation print / Web Publisher](#)

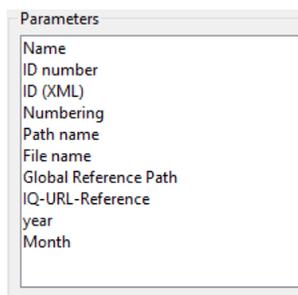
[Process Flow Diagram line color](#)

Command-Line Bookmarks

The IQ-Url-Reference so far offers the possibility to jump from external systems to an object in the APIS IQ software. This behaves like a parameterized call into IQ software.

With the Command-Line Bookmark a parameterized call of an external system/application can be done out of IQ software, e.g. to customer complaints management systems.

The definition of a Command-Line Bookmarks has to be done via the menu: Tools | Workstation settings | Settings | System optimization | Other.



Picture: Parameters for the integration in Command-Line Bookmarks

After having defined it, the Command-Line Bookmark can be inserted at selected objects. The available parameters for the call correspond to the object attribute available at the selected object. By opening the bookmark, an external program can be opened e.g. with the parameter **ID number**.

Palette representation based on previously selected representation

Palette representations offer a simple possibility to switch assigned symbols, e.g. in the Process Flow Diagram and in the Control Plan.

So far a new representation was completely empty and had to be filled with symbols again.

In Version 7.0 an existing representation can be selected and this will be used as template for the new representation then. That means, all mappings will be copied and only necessary changes have to be done.

Customer Requirements Management

In Version 6.5 users of APIS IQ-FMEA PRO and APIS IQ-RM PRO could activate the Customer Requirements Management. Now it is available in all product flavors.

The integrated Customer Requirements Management is inactive by default. Like other application components this functionality can be activated via [Workstation Settings | Settings | Application components](#).

The functionality is unchanged to Version 6.5. It enables to work on the customer requirements assigned to the project in the [Customer Requirements Editor](#) and [Deadline Customer Requirements Editor](#).



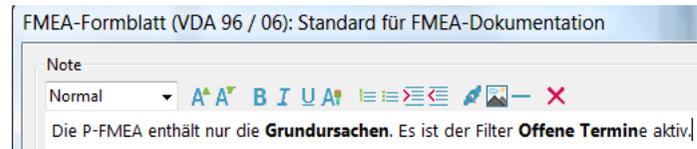
Picture: Customer requirements in the Customer Requirements Editor

The information from the Customer Requirements Management can provide important input for some features related to Design for Six Sigma (DfSS).

Presentation print / Web Publisher

Presentation print and Web Publisher offer many possibilities to choose settings for each selected component. Display options can be changed or filters can be set.

An additional information can be integrated in the output now, e.g. as additional sheet in the Presentation print. The additional information comes from a note, which can be entered at the chosen components in the batch.



Picture: Example for a note at a component of the Presentation print

Process Flow Diagram line color

The connecting lines in the Process Flow Diagram now include the attribute Color.



Picture: Connecting line in the PFD with color attribute Red
