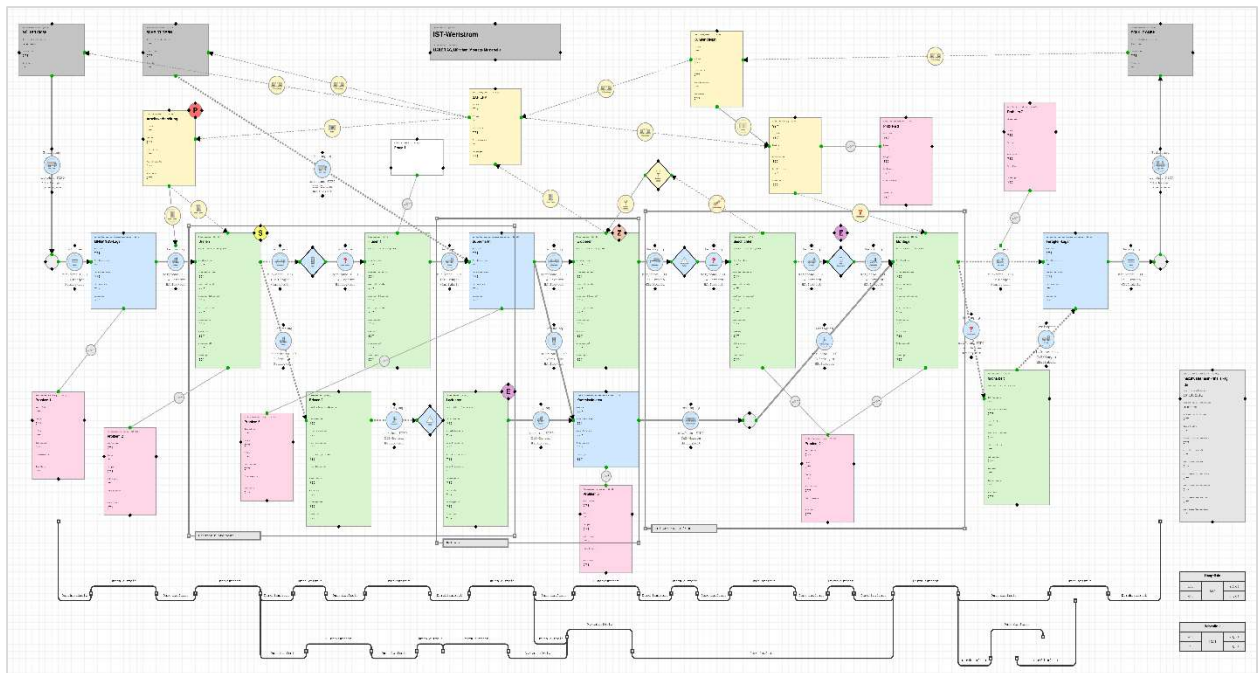
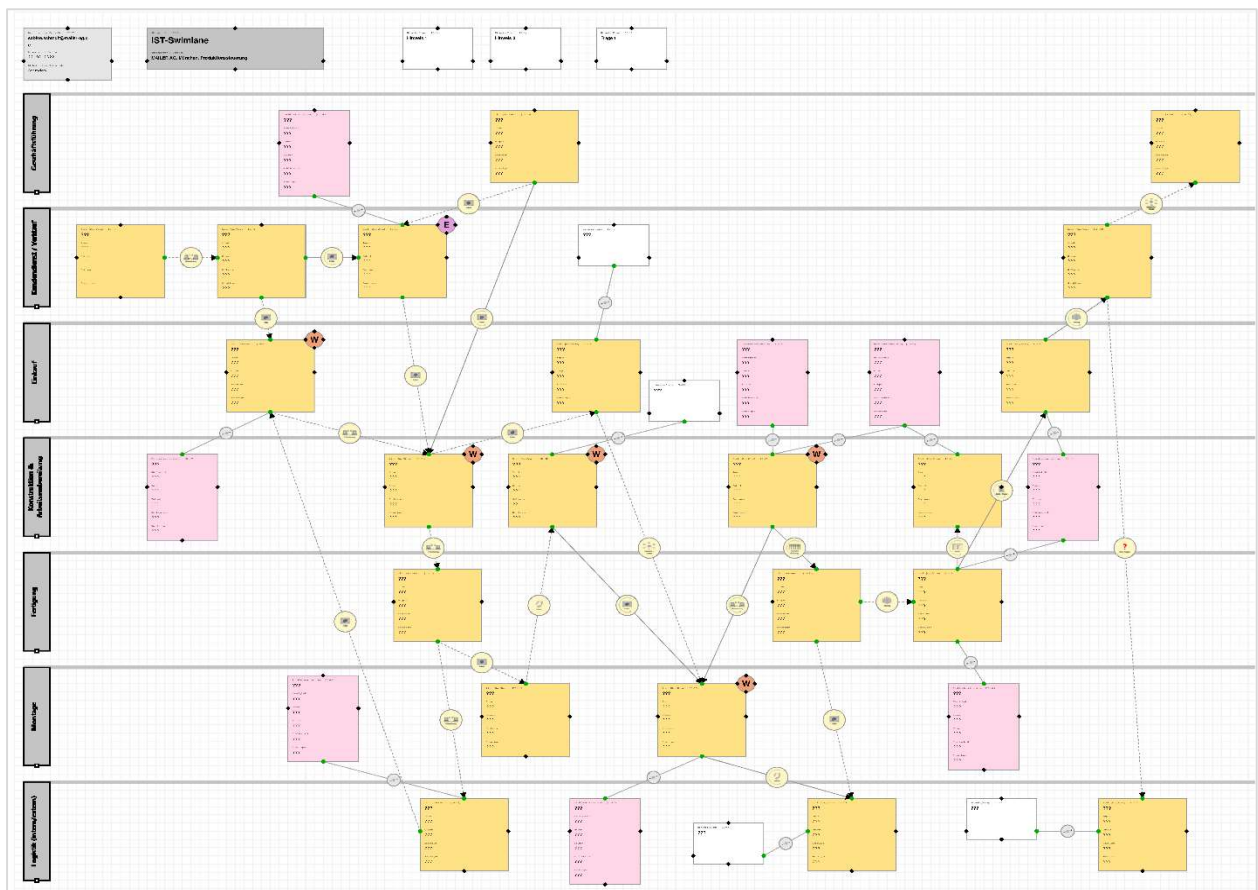


PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Example of a "value stream diagram" with the display option "Colored":
(material flow from left to right; information flow generally from top to bottom)



Example of a "swimlane diagram" with the display option "Colored":
(no material flow; information flow generally from left to right; stripes = departments)



PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

General Information and Basic Elements:

- 1) The program "SWST Value Stream Tool" is used to create value streams graphically, as they are often used in LEAN projects to improve production. The display is based on Mike Rother's book "Learning to See" and has been adapted for practical use. I have given the elements colors, which can optionally be switched to white. The program is also well suited for creating "swimlanes", which are an established way of depicting collaborative work processes in administrative areas.
→ For more on the WHY / WHAT FOR / TO WHAT END, see below.
- 2) The program window consists of 3 main areas: the header bar, the element column on the left and the value stream area on the right. The size and position of the program window can be adjusted as usual for all Windows programs. The visible part of the value stream area can be enlarged/reduced with the ZOOM buttons (top right) and moved with the scroll bars (and the mouse wheel).
- 3) The header bar contains a search field with a start/pause button, the display of the file name, and the buttons for the main menu, saving, box alignment, zoom and the language.
- 4) The element column contains buttons with which the various elements of a value stream/swimlane diagram can be created in the value stream area. Some of these buttons are colored to make orientation easier. These elements can be activated by clicking in the element column and then created by clicking in the value stream area.
- 5) In the value stream area the value stream/swimlane diagram is built up and designed step by step from the individual elements. This area can be expanded if space runs short. The diagram can be reduced/enlarged with ZOOM. All elements snap to the grid.
- 6) A value stream consists of standardized boxes, connectors and symbols with which the user graphically depicts the material flow (from left to right) and the information flow (from top to bottom or from right to left). The suppliers are normally placed at the top left, the customers at the top right and the control in the top center. Below this lies the main value stream, possibly with branches into secondary value streams. Below that again are meander lines with the process and waiting times of the main value stream. General information and summarizing key figures are often shown in an information box at the bottom right.
- 7) A swimlane diagram consists of horizontal stripes for each relevant department / team, in which boxes for the relevant administrative processes are placed; these are then linked to one another with information flow connectors. Administrative processes can basically be divided into processing, information and decision/meeting.
- 8) In the boxes relevant information can be entered as text and numbers in individual text fields. This is used in particular to document the processes in production, logistics, control and administration. Boxes have 4 ports (= small diamonds in the outlines) to which connectors can be docked.
- 9) The large diamonds show processes by means of symbols and without a detailed text description. They have 4 ports (= small diamonds at the corners) to which connectors can be docked. In addition, there is a text field below the diamond in which, for example, the name of a warehouse, the location of a buffer or the current stock quantity in a buffer location can be entered.
- 10) The connectors are straight arrow lines that are always displayed above boxes and diamonds. In the middle, an exchangeable symbol shows the "type of transport" for material (light blue) or information (light yellow). A distinction is made between push (dashed line, without circular arrow) and pull (solid line, with circular arrow). There are also gray box connectors without an arrow, which can be used to create references between boxes. Material flow connectors have 4 editable text fields and 2 ports above/below the symbol. Information flow connectors only have 2 editable text fields above/below the symbol.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

- 11) All connectors have dots (= small circles) at their ends, which can be docked to the ports (= small diamonds) of boxes, nodes, markers and material flow connectors. All docked connectors realign automatically when the boxes/nodes/markers are moved. Directly after a new connector has been created, its right dot is pre-activated in red for docking.
- 12) With nodes connectors can be linked to one another and thus also routed "around corners". They also serve to make branches of connectors clearly recognizable.
- 13) The box connectors only serve to show a connection between (more distant) boxes. For example, a problem box can be placed legibly at the edge of the value stream area, while the box connector shows the reference to a process box.
- 14) The markers are like stamps and serve to highlight important characteristics / weak points. They can be fixed to boxes, diamonds and connectors. Fixed markers have a gray ring; unfixed markers have a black ring. In addition, markers each have 4 ports for docking box connectors to problem/note boxes.
- 15) The frames serve to mark sub-areas (e.g. halls, areas of responsibility). They are usually placed around several boxes and labeled at the bottom.
- 16) The swimlanes mark horizontal stripes across the entire width and have a box on the left side for the name of the department. These boxes always stay at the left edge, even when scrolling, and float above all other elements.
- 17) The LT meander lines serve to show the lead times (= LT) of the main material flow and of important secondary material flows. Usually, the meander lines curving upward are placed below boxes and the meander lines curving downward are placed below material flows. The ends can also be moved vertically to follow branches. The times are then entered manually on the meander lines as plain numbers.
- 18) The LT summary boxes show the total lead times (= LT) along a material flow and their percentage shares. The summary box is usually placed at the right edge next to the meander lines. These totals can be determined manually or automatically.
- 19) The value stream area has a grid with which the top left corner of a box or the center points of the markers can be aligned neatly.
- 20) At the top right of the header bar is the main menu button (= 3 horizontal lines = hamburger menu) with further functions (e.g. save, open, terms of use, privacy notice). Printing on paper is not intended, as the required size cannot be achieved on normal printers. As an alternative, the diagram can be saved as PNG with 300 dpi so that the image can be shown in presentations or printed out on a plotter.
- 21) LT meander lines, frames and swimlane boxes have handles (= small squares) at their ends/corners to change the size of the elements with drag & drop.
- 22) The length of connectors cannot be adjusted directly. As soon as their dots are docked to ports, they are automatically aligned between them.
- 23) The size of boxes adapts automatically to the amount of text and the text fields in them.
- 24) All texts / symbols in boxes, connectors, frames, LT meander lines and summary boxes can be edited / adjusted by double-clicking. The popup window that opens displays the text independently of the zoom level (so the text is easy to read). The TAB key switches between text fields. The "???" serve as visual placeholders (the text field is nevertheless classified as "empty"). ENTER saves the current state and closes the popup window. Simple calculations can also be entered with a leading "=".

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

- 25) The box text fields can be set up individually: there are standard text fields with fixed names; additional text fields can be created; the visibility of the text fields can be set to "always / when filled / only edit box / only setup box"; the order of the text fields can be changed for each box type. A user can also define individual text fields (and then reuse them again and again), and can adopt text fields from other value stream diagrams into their own text field collection. In this way, text fields from value stream files can also be passed on to other users and automatically added to the internal user file "SWST-Benutzerdaten.json". With OPEN FILE, the original version is always displayed (even if it contains text fields that the current user does not have in their text field collection). Regardless of the visibility settings, all text fields with their content are always shown in the popup window for viewing all text fields and in the text field export to Excel.
- 26) The program language can be set and is taken into account when saving and opening. All labels in the program window, in the element column, in the main menu and in the popup windows, all text field names in boxes, and the labels in the symbols and markers adapt to the current language. By contrast, all user entries in text fields and the names of non-standard text fields are not affected by the language settings. Switching the language therefore does not translate user entries and should only be done once when the program starts. The language at program start can be defined.
- 27) The text size of controls, buttons and popup windows can be set. The text size in the value stream or swimlane diagram is set via the zoom level.
- 28) In the boxes relevant to the process flow, there is the text field "Category Designation" at the bottom, into which freely chosen terms can be entered. This allows further subdivisions to be introduced within a box type. So-called BPMN designations for process diagrams in administrative areas (see e.g. "www.bpmn.org") can also be added there; these are then also available for further analyses in the exported Excel file and thus also for other programs.
- 29) With the search function (top left of the header bar), text can be found in all text fields and highlighted in red. The play/pause button next to it can be used to interrupt the search.
- 30) Each box has an identification number (= ID), which is shown in brackets in the heading of the top text field. The identification numbers of diamonds and connectors are shown below the symbol. Markers, meander lines, frames and swimlanes have no visible ID number.
- 31) A quick overview of the text fields of all elements can be displayed in a popup window via the main menu "Show text field tables". Double-clicking on a row opens another popup window for editing. After OK, changes take effect in all displays.
- 32) For further analyses, all text fields can be exported in real Excel format via the main menu "Export text fields to Excel". There is one table for each box type, for material and information diamonds, for material flow and information flow connectors, and for the markers. The ID of each element is given there, together with the references to connected boxes, diamonds, connectors, problem/note boxes and markers. The top row is frozen and prepared with autofilters. Numerical values are visualized per column with light brown bars.
- 33) A user can create templates for diagrams. These templates use the display settings stored in the value stream files (e.g. color, symbol size, display / order of the text fields, individual text fields, language, zoom level). Alternatively, diagrams can also be started with the standard settings (and individualized as required).
- 34) A user can register by email in order to receive information about software updates.
- 35) A user can license the software by email in order to continue using it after the free usage period has expired and to acknowledge my work as a programmer. Otherwise, after the free usage period has expired, the functionality of the software is reduced to opening SWST files and saving in PNG format. Your diagrams can therefore still be viewed/used, but can no longer be edited/analyzed. When the

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

program starts, a notice window appears with information on the license expiry date, which can be closed with OK. The current license is shown together with the license expiry date in the header of the Windows window. An additional license period is added to the license period still running. The following applies: 1 month = 30 days.

- 36) The data entered by the user during registration and licensing is saved in the file "SWST-Benutzerdaten.json".*. This file is located in the program directory. If it is deleted, moved or renamed, the program starts without registration and licensing. The combination of email, computer number and license key is decisive for the license check.
- 37) In the main menu, users will find these operating instructions, as well as a symbol overview, the terms of use and privacy notice as PDF. There is also information on the legal notice (imprint).
- 38) Explanation of PUSH versus PULL: PUSH / PULL indicates whether material deliveries or information are triggered or called off by the supplier (= PUSH) or by the customer (= PULL). It does not say who transports them. The direction of the arrow shows the direction of flow of the material or information. A pull information flow is therefore a query. And the information on a physical production control board is filled with PUSH and retrieved with PULL.
- 39) Explanation of branches in the flow due to conditions or decisions: The specific conditions for branches / decisions are not entered in a special decision box/diamond, but in the text field CONDITION directly on the connector.
- 40) Explanation of lead time (LT): LT is one of the most important key figures in LEAN implementation. It indicates how long a product in the production process or a piece of information in the administrative area is under way between two defined points in the flow. It is therefore a measure of the sum of productive processing times and unproductive transport & waiting times. It applies to normal processes with FIFO, i.e. without prioritization. The calculation of the lead time per process or transport depends on many factors (e.g. takt times, cycle times, inventories). As a rule, the share of transport & waiting times is significantly greater than the share of processing time. With shorter LT, customer requirements can be met more quickly without larger inventories.

* = The program directory is usually: C:\Users\<USERNAME>\AppData\Roaming\SWST-Wertstrom-Tool

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Functions / Way of Working / Convenience (often several variants a/b/c are possible):

1) Mouse commands:

Many users may not be aware of how many different mouse commands they intuitively perform in everyday life. The program distinguishes: right mouse button; left mouse button; click & release once; click & release twice (= double-click); click & hold, then move, then release (= dragging = drag & drop); turning the mouse wheel; pressing the mouse wheel to the right/left

2) Adding new elements to the value stream area:

a) by activating & inserting:

The user clicks (without holding the click) with the left mouse button on an element (= box, diamond, connector, marker, area, lead times) in the element column. A temporary red frame around the element button in the element column then gives visual feedback on where the last click was. When the user now moves the mouse pointer over the value stream area, a red dashed line at the mouse pointer shows the object size and position. If the user now clicks in the value stream area, the selected element is created there (and the red markings disappear again). The problem and note boxes automatically receive a docked and pre-activated box connector when they are created.

b) by duplicating an element:

The user right-clicks on an element and then selects "Duplicate element" in the context menu (specifically, e.g. "Duplicate box", "Duplicate diamond"). A duplicate of the element with the same texts / symbols then appears, slightly offset to the bottom right. This duplicate has a new ID number, is not docked and has no fixed markers.

3) Editing an element in the value stream area:

The user double-clicks on an element with the left mouse button to open a popup window for data entry or for changing the symbol. At its bottom edge there is also the option to set the general visibility of text fields in elements of this type (see #18). This popup window is independent of the zoom level. The text fields displayed in it and their order can be set for each box type via the main menu "Set up (new) box text fields". New text fields can also be added there.

4) Moving a single element in the value stream area:

The user clicks (and holds the click) with the left mouse button on an element in the value stream area, moves the element to the desired position and releases the left mouse button there (= drag & drop). Pressing the SHIFT key at the same time only allows horizontal / vertical movement (= the direction with the shorter movement distance is blocked).

5) Selecting and moving several elements as a group:

- The user clicks on an empty spot in the value stream area and then drags over the elements to be grouped while holding down the mouse button (the area is temporarily marked by a red dashed line). All completely enclosed elements are colored red.
- If the user now presses the CTRL key and at the same time clicks on additional elements (not yet outlined in red), these elements are added to the group and also colored red. If the user instead clicks on an element that is already marked red, it is removed from the group and colored black again.
- If, after selecting a group in this way, the user next clicks on one of the selected elements without the CTRL key and holds down the mouse button, the entire group of selected elements can be moved to another location. Note: swimlanes cannot be selected and added to groups, as they are only moved vertically.
- If the user presses the SHIFT key while moving, the movement is only horizontal/vertical relative to the mouse position at the start of the movement (= the direction with the shorter movement distance is then blocked).

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

6) Aligning a group of elements vertically:

- The user selects the desired elements with a lasso rectangle or CTRL+click and then clicks the align button at the top of the header bar. All boxes (including their fixed markers) are then aligned to the highest top edge of the selected boxes. At the same time, all selected diamonds (including their fixed markers) are aligned to the highest box (and if no box was selected, the diamonds are aligned to the highest diamond). At the same time, all selected meander lines are aligned (those curved upwards to their topmost meander label; those curved downwards to their lowest label). All docked connectors are adjusted accordingly.

7) Docking connectors to boxes:

- Material flow connectors should be docked at the sides so that the LT meander lines below can later be assigned neatly. All other connectors should be docked vertically.
- A connector dot that is already docked can also be activated again and docked to another port. Several connectors can also begin / end at one port.
- A connector that has just been created in the value stream area is already activated (= connector circle is red) and has a pre-activated dot (= dot is red).
- Clicking on a connector dot activates a dot (= dot is red). After the 1st dot has been docked, the 2nd dot is activated automatically. Docked dots are green.

a) by connector circle activation:

The user first clicks with the left mouse button in the connector circle (to activate a connector for the upcoming docking; the circle line then turns red), then on one of the dots of the connector (the dot then turns red) and then on a port of a box / node / marker / connector (the red connector end then jumps to this port and the dot turns green). Ports on the connector itself and ports to which a dot of the connector is already docked are blocked.

b) by direct dot activation:

The user clicks on a connector dot to activate it. The dot turns red (if it is not yet docked) or red-green (if it is already docked), and the connector circle of the associated connector turns red. The user then clicks on a port. The dot then jumps to this port, turns green, and the connector aligns itself to this port. If the user clicks anywhere else in the meantime, the activations are reset.

Note: If there are several dots on one port, clicking several times activates the connectors docked there in rotation.

c) by drag & drop:

The user clicks on a dot (and keeps the mouse button pressed), moves the mouse over a port and releases the mouse there. The dot and its connector visually move along with the movement. After successful docking to this port, the dot turns green and the connector circle, previously activated in red, turns black again. If the user does not release the mouse over a valid port, the dot and its connector jump back to the original position and the docking process is cancelled.

8) Detaching a connector from all ports:

The user right-clicks on the element to open a context menu and then left-clicks the corresponding command there. The previously red dots then turn black, and the connector can be moved again.

9) Switching the connector type PUSH/PULL:

A push connector has a dashed line and no curved arrow in the symbol. Pull connectors have a solid line and a curved arrow in the symbol. Switching between push and pull is easily done in the context menu of the connector with "Switch Push/Pull".

10) Clearing connector text fields:

At the bottom of the edit popup window for connectors there is a checkbox with which all text fields of the current connector can be cleared. This is useful if you generally do not want placeholder texts

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

there, or for connectors with the "=" symbol (which are meant to represent a continuation of the flow described before/after at a node).

11) Fixing markers to boxes, diamonds or connectors:

First, a marker must be created. When a marker is moved, it then jumps to nearby possible fixing points. These possible fixing points are temporarily shown with small gray circular rings. When the mouse button is released, the marker is fixed at the last fixing point. A fixed marker gets a gray circular ring; unfixed markers have a black circular ring. Moving an already fixed marker to another fixing point is also possible. Only 1 marker can be fixed at each fixing point. Fixed markers are moved together with their element.

12) Documenting problems / ideas and questions / notes:

When recording and depicting workflows, it is very useful to also document problems / ideas, as they are often an important source of improvements. Traditionally, kaizen bursts with short problem descriptions are used. Here, the PROBLEM box should be used for this, into which solutions / ideas / suggestions / wishes can of course also be entered. In the NOTE boxes, current uncertainties, details on information sources or notes on counting points for key figures can be documented.

13) Deleting an element in the value stream area:

The user right-clicks on the element to open a context menu and then left-clicks the corresponding command there. If an element to which a marker is fixed is deleted, this marker is deleted as well. If an element is deleted to whose port a connector dot is docked, this dot is undocked (= colored black again).

14) Deleting all texts in a box in the value stream area:

The user right-clicks on the element to open a context menu and then left-clicks the corresponding command there.

15) Duplicating an element in the value stream area:

The user right-clicks on the element to open a context menu and then left-clicks the corresponding command there. The duplicated element contains all text entries, the symbol and the size of the original, as well as a new ID. Docking states and fixings are not transferred. When an LT summary box is duplicated, the underlying LT meander lines for an auto total are transferred as well. This function is useful if, for example, you want to show a process several times in a similar form.

16) Changing the size of frames, swimlanes and meander lines:

The user clicks on one of the handles (= small rectangles), moves it to the desired location while holding down the mouse button and releases the mouse button there (= drag & drop). The handles of frames and meander lines can be moved vertically & horizontally; those of the swimlane rectangles only vertically. When meander lines are moved, temporary vertical blue guide lines are displayed below the corners of boxes and diamonds to make positioning easier.

17) Expanding the value stream area:

The user opens the main menu (top right of the header bar) and selects the corresponding command. The area is then expanded by 400 pixels each time (which corresponds to the width of 2 process boxes) at the current outer edge of the value stream area. Reducing the area is not possible, as this would require automated answers to questions about how to handle the elements located there – questions that cannot be resolved unambiguously.

18) Hiding/reducing text fields in boxes (= visibility):

- This function makes it possible to create compact diagrams in which only the essential text fields are displayed. A distinction can be made as to whether a text field is displayed in the box "always" or "only when filled".

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

- In addition, a distinction can be made as to whether a text field is displayed "in the edit popup and in the setup popup" or only "in the setup popup". This means that text fields that are not displayed in the box can still be used/read. In this way, the edit popup can be shortened.
- Visibility settings always apply to all boxes of the same type.
 - a) via "Set up (new) box text fields" → individually:
The user selects the command "Set up (new) box text fields" in the main menu and marks (in the popup window that then opens) those text fields that are to be displayed in the value stream "always / when filled / only edit box / only setup box". The settings are applied after OK. This allows the visibility to be set individually for each text field.
 - b) via "Set up (new) box text fields" → globally:
The user selects the command "Set up (new) box text fields" in the main menu and, in the bottom row, selects a general setting for all boxes. Any existing individual settings are then overwritten and finally applied with OK. The bottom row also contains a non-clickable radio button that shows whether individual settings currently exist.
 - c) via the visibility setting in the edit popup windows:
The user double-clicks on a box and, above the OK / CANCEL buttons, selects a visibility that then applies to all text fields of this box type. There is also a non-clickable radio button there that shows whether individual settings currently exist. A change here affects all boxes of this box type.

19) Changing the order of text fields in boxes:

The user selects the command "Set up (new) box text fields" in the main menu and moves (in the popup window that then opens) the text fields available in the value stream using the move buttons. The row currently being moved is framed in red. Text fields can only be moved within their box type. Text fields that only have a check mark in the User column are not available in the value stream, and their order cannot be changed either. The settings are applied after OK.

20) Adding additional text fields to boxes:

The program offers standard text fields for each box type, whose names cannot be changed. The user can set up additional text fields by selecting the command "Set up (new) box text fields" in the main menu (top right), clicking on one of the "+" buttons (in the popup window that then opens) and giving the text field an individual name. The changes are only applied after clicking OK. This new text field is then displayed in all affected box types. Alternative: The user can also open a value stream file that contains text fields they have not yet set up. To adopt such a text field for future use, all that is needed is to add a check mark in the User column. Caution: Removing check marks permanently deletes the text fields!

21) Deleting additional text fields from boxes:

The program offers standard text fields for each box type, whose names cannot be changed and which cannot be deleted but can be hidden. In general, users should consider whether they really want to delete text fields or whether hiding the contents is sufficient, because a deletion cannot simply be undone. To delete text fields, the user selects the command "Set up (new) box text fields" in the main menu (top right) and then removes (in the popup window that then opens) the check marks in the User and/or Value Stream columns. The changes are only applied after clicking OK.

22) Searching for text:

The header bar contains an input field for text search. A string of letters and digits entered there is immediately searched for in all text fields of boxes, diamonds, connectors and LT meander lines. If the search string is found in a text field, the text in the entire text field is colored red until the search string is changed, the PAUSE button is clicked or ESC is pressed. The search string is retained. Texts can also be edited while they are highlighted. Opening a file sets the search to PAUSE.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

23) Setting up swimlanes:

The swimlane diagram differs greatly from the value stream diagram: the entire workflow is built up only with "Administration boxes" and "Push/Pull information flow connectors". In addition, there is a value stream heading box at the top, a value stream information box at the edge and, if required, problem boxes, note/question boxes, nodes and markers are also used here. It is recommended to first define the relevant and visible text fields in the "Administration box type" and then set their visibility and order with the main menu command "Set up (new) box text fields". Then the height of the swimlane boxes can be adjusted to the required size of the administration boxes and the individual swimlanes can be placed one below the other. This keeps the overview compact. If there is not enough space in the display area, the display area can be expanded (with the corresponding commands in the main menu). However, the display area cannot be reduced.

24) Showing lead times (using LT meander lines and LT summary boxes):

- The LT meander lines and the LT summary box show the lead times of the main production flow at the bottom edge. The unit should be the same everywhere.
- If there are additional secondary production flows, their LT can also be shown with additional LT meander lines and one additional LT summary box each. For this purpose, the ends of the LT meander lines can also be moved vertically in order to visually show the relationships to the boxes and vertical value stream branches.
- In LT summary boxes, a distinction is usually made between the "total of all times in production processes" (often called "value-adding times") and the "total of all times in logistics processes" (often also called "non-value-adding times" or "waiting times"). The grand total and the respective percentage share of it are calculated automatically.
- Simple calculation formulas starting with "=" (e.g. $= (3+5.5)/2$) can also be entered in the text fields of the edit popup window of the LT meander lines.
- a) Manual totals: If the times on the LT meander lines have different units, the individual times must be added up with a calculator and the total then entered manually in the LT summary box.
- b) Auto totals: If the times on the LT meander lines have the same units, the LT can also be added up by clicking. To do this, the user first opens the popup window for editing by double-clicking on an LT summary box. Then the user clicks in the auto total field to be filled and then, one after the other, on the relevant times on/below the LT meander lines. The LT meander lines clicked in this way are temporarily colored red as long as the popup window is open, and their total then appears automatically in the time field. Clicking again on an LT meander line marked in this way removes it from the auto total. If an LT meander line is deleted, its LT is automatically removed from the total. If a time is changed, the auto total is also updated automatically. Times that were not written as plain numbers are ignored (but the meander line can still be clicked and thus marked red).

25) Enlarging/reducing the value stream area = zoom:

- The display size of the elements in the value stream area is shown at the top right of the header bar. It can be set in 10% steps in the range 30% - 150%.
- Many users want the mouse pointer as the fixed point when zooming, but this leads to an automatic and very confusing overlap with the scroll function as soon as a fixed edge of the value stream area is reached. This only works with free edges. Therefore, the top left corner of the value stream area is used as the fixed point here.
- a) The display size of the elements in the value stream area can be enlarged and reduced with the two ZOOM buttons at the top right of the header bar.
- b) The display size of the elements in the value stream area can be enlarged and reduced with the mouse wheel if the CTRL key is pressed at the same time.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

26) Moving the viewing area (panning):

- When it comes to moving, people argue about the logical direction. Microsoft, Apple, the mouse wheel instead of scrolling, and swipe gestures on touchpads all handle this differently. The difference lies in whether you move "the viewing area over the objects" (= Microsoft) or "the viewed objects under the viewing area" (= Apple & touchpads). When using mouse wheels instead of scrolling, both settings exist.
- a) The current viewing area can be moved vertically and horizontally over all objects or elements with the two scroll bars. This is the intuitive behavior of users in Microsoft programs with scroll bars.
- b) All objects or elements in the value stream area can be moved together under the viewing area with drag & drop if the SPACEBAR is pressed at the same time. This is the intuitive panning behavior of users in various drawing programs and corresponds to the usual behavior on Apple devices and on touchscreens.

27) Changing the language:

- To change the language of the controls, buttons, main menu, popup windows and the standard text fields in the boxes, the user selects the language at the top right of the header bar.
- In addition, the language of the current document and the language at program start can be defined in the main menu under "Settings".
- Texts that users can edit are not changed when the language is switched. This function would be desirable, but in practice it has caused a lot of confusion, because users use department-specific terms and abbreviations here that no translation program can handle.

28) Changing the text size:

To take into account different screen sizes and the eyesight of users, the text size of controls, buttons, the main menu, popup windows and the text fields in the boxes / diamonds / connectors can be adjusted in the main menu under "Settings". The text size in the elements can be changed via the zoom level.

29) Changing the symbol size in the connectors:

To take into account different screen sizes and the eyesight of users, the size of the symbols in the material flow and information flow connectors can be adjusted in the main menu under "Settings". The connectors may then need more space and may cover other element components in existing diagrams.

30) Viewing / editing several diagrams at the same time:

- To work in several value stream diagrams at the same time, the user can open the SWST program several times.
- Copying individual elements or groups of elements between 2 open diagrams is not yet supported.

31) Setting up the "user settings" and/or the "current diagram":

- The "user settings" can be defined in the main menu under "Settings". They are saved in the internal file "SWST-Benutzerdaten.json": language; fill colors (colored or white); size of the symbols in the connectors; font size in the controls and popup windows; license notices at program start.
- The setting "... at program start and for new diagrams" applies at program start and every time "Close diagram (start new)" is clicked.
- The setting "... in the current diagram" takes effect immediately on the current diagram and is saved in the value stream file when saving. When opened, the file therefore always appears exactly as it was saved.
- The font size in the displayed elements can be changed via the zoom.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

32) Settings at program start, when opening a file and with "start new":

- The settings of the user and of the current diagram have different effects at program start, when opening files and with "Close diagram (start new)".
- Program start: The fixed program setup applies, i.e. all standard text fields in the standard order, always visible, and zoom 100 %.
- Opening a file: The setup saved in the file always applies (original view).
- Close diagram (start new): The new diagram adopts the setup that is currently active. This is the setup of the most recently opened file, or the program setup if no file has been opened yet. Changes made in the popup "Set up (new) box text fields" are included.
- Additional text fields with a check mark in the "User" column are permanently saved in the user file. They are therefore available for selection in every diagram and become active in the current diagram through the check mark in the "Value Stream" column.
- This opens up the possibilities a) to create new diagrams that adopt the design and settings of the previously opened file, or b) to create new diagrams with the standard design, or c) to use templates.

33) Creating and using templates for diagrams:

- Anyone who frequently wants to work with the same text field setup can create templates:
 - 1.) Start an empty diagram via "Close diagram (start new)".
 - 2.) In the popup "Set up (new) box text fields", activate the desired text fields and then define their visibility and order.
 - 3.) Save the empty diagram under a meaningful name.
- For a new diagram, you then open the appropriate template and click "Close diagram (start new)" in the main menu. The new diagram adopts the settings of the template, and the template itself remains unchanged.
- The same also applies to files of other users. Anyone who opens another user's file and then selects "Close diagram (start new)" adopts its text field setup, including its additional text fields. This can be checked and changed at any time in the popup "Set up (new) box text fields".
- Restarting the program always returns to the fixed program setup.

34) Notes on Cut, Copy, Paste, Delete, Enter, Esc, Undo:

- Texts in text fields can easily be transferred with the usual keyboard commands CTRL+X (= cut), CTRL+C (= copy) and CTRL+V (= paste).
- The ENTER/RETURN key and the ESC key work in popup windows when editing texts as well as in the search function.
- To reduce operating errors, I have deactivated the DEL key for deleting elements. Elements can only be deleted via the context menu and only one at a time.
- There is currently no way to reverse commands and activities with UNDO. The programming effort would be considerable – saving frequently also helps.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Standard Text Fields of the Box Types:

- 1) Value Stream Heading (color: dark gray):
Heading; Company & Department
- 2) Customer/Supplier (color: dark gray):
Company Name; Role (Customer/Supplier); Country & Location; Other; Category Designation
- 3) Production (color: green):
Process Name Production; Goal (What/Why); Location/Position/Station/Equipment; Number of Employees; max. Cycle Time; average Cycle Time; min. Cycle Time; Working Time; Waiting Time; Downtime; Utilization/OEE; Defects/Rework/Scrap; Material Stock; Material Provisioning; Material Demand Notification; Tools/Equipment; Other; Category Designation
- 4) Logistics (color: blue):
Process Name Logistics; Goal (What/Why); Location/Position/Area/Equipment; Number of Employees; Working Time per Occurrence; Duration per Occurrence; Material Stock; Material Provisioning; Coverage/Dwell Time; Internal Transport/Handling; Other; Category Designation
- 5) Control (color: light yellow):
Process Name Control; Goal (What/Why); Trigger; Process/Activity; Person Responsible; Decision Maker; Software; Other; Category Designation
- 6) Administration (incl. the usual SIPOC fields; color: dark yellow):
Process Name Administration; Goal (What/Why); Area/Department/Team (Who); Number of Qualified Employees; Trigger; Supplier; Input; Process/Activity; Output; Customer; Person Responsible; Decision Maker; Type of Decision-Making; Software; Working Time per Occurrence; Duration per Occurrence; Frequency; Other; Category Designation
- 7) Problem (color: pink):
Problem Description; Frequency; Duration; Consequences / Impact; Severity; Improvement Suggestion; Photo Numbers; Other; Category Designation
- 8) Note (color: white):
Note/Question
- 9) Value Stream Information (color: light gray):
Email of Last Editor; Date of Last Change; Unit for All Time Values; Shift Times; Total Number of Employees; Total Process Times; Total Waiting Times; Lead Time (LT); Other

- Note: In many cases, the text fields still leave room for interpretation. In principle, all text fields should be defined more clearly before/during the creation of the value stream. This concerns in particular: minimum/average/maximum values, counting methods & exceptions, and units.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Basic Procedure for Graphically Creating a Value Stream / Swimlane:

- 1) Define the objective for recording the workflows / processes
 - Why are we doing this?
 - What do we want to achieve with it?
 - What advantages / benefits result from it?
 - What will we do with it afterwards?
- 2) Define the relevant sub-areas for recording the workflows / processes
 - Which departments do we want to look at and thus involve?
 - Which interfaces do we want to look at / question in particular?
 - What are the limits of the recording? (= What do we not want to look at?)
 - Which employees & managers are our contacts / participants for this?
- 3) Inform those affected and involved about the upcoming recording
 - Who is responsible and who is the moderator?
 - Who informs those affected and involved? How is the works council to be involved?
 - When and where should the recording take place?
 - What capacity is likely to be required for this?
 - Where is the project room?
- 4) Carry out the recording
 - Which details are important/unimportant?→ Select or create text fields for the boxes
 - Which elements and symbols does the SWST Value Stream Tool offer?→ Print the symbol overview
 - Ask those affected about their experiences and problems with the real workflows
 - Ask those affected about their wishes / improvement ideas / recommendations
 - Document all relevant statements in the boxes (processes & problems & notes)
 - Towards the end: verify / specify the recording with those affected
- 5) Discuss and prioritize findings and improvement measures
 - Where is the bottleneck and where is the pacemaker?
 - How can the quantity and the LT be influenced there in particular?
 - Which quantified improvements can be achieved through which changes?
 - Which specific measures result from this?→ Create an action plan
- 6) Further notes
 - Usually, a CURRENT-STATE value stream is created first, then an IDEAL-STATE value stream is considered, and from this a realistically achievable TARGET-STATE value stream is derived as the target condition.
 - The value stream is recorded against the direction of flow so that the work result is known.
 - On the material flow connectors, the transport quantity and/or the stock quantity at the unloading point is entered in the field TRANSPORT/STOCK QTY. The LT of the transport route is then calculated from this.
 - All time values must have a clear unit. A common unit must be defined for all time values in the SWST Value Stream Tool (e.g. seconds, minutes, hours).
 - The specific conditions for branches / decisions are not entered in a special decision box/diamond, but in the text field CONDITION directly on the connector.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Advantages of the SWST Software over Post-its, PowerPoint, Excel, Visio

- everything is easy to read (no hard-to-read handwriting)
- everything can be changed/supplemented quickly and versioned via file names
- definable text fields (use only relevant information; additional fields as required)
- automatic box size (size adapts to the amount of text)
- text fields can be hidden (creates clarity without removing details)
- all elements can be moved individually or in groups (diagram is easy to adapt)
- all connectors can be docked and move along when the boxes / diamonds are moved
- display area can be expanded as required in all directions
- diagrams can be viewed on the computer (not only on paper in the project room)
- diagrams can be copied to create variants quickly
- quick creation of a target-state diagram from a current-state diagram (copy the file and change it)
- all entries in the text fields can be quickly exported to real Excel (not via a CSV file)
- value stream symbols are integrated in connectors (no tedious placement of drawing elements)
- no kaizen clouds with too little space for text, but problem boxes with a connecting line
- fixable markers that highlight pacemaker, time spread, waiting time, bottleneck and urgent
- logical colors for visually distinguishing the elements (black/white optionally selectable)
- automatic summation of the LT times
- no unintended changes to PowerPoint/Excel/Visio templates
- In practice: No Post-its fall off the wall or get blown away by the wind! Working with Post-its on brown paper brings the participants together. I often start with Post-its and then switch to SWST; but I would not want to put anyone through the fiddling in PowerPoint, Excel or Visio.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Why / What For / To What End?

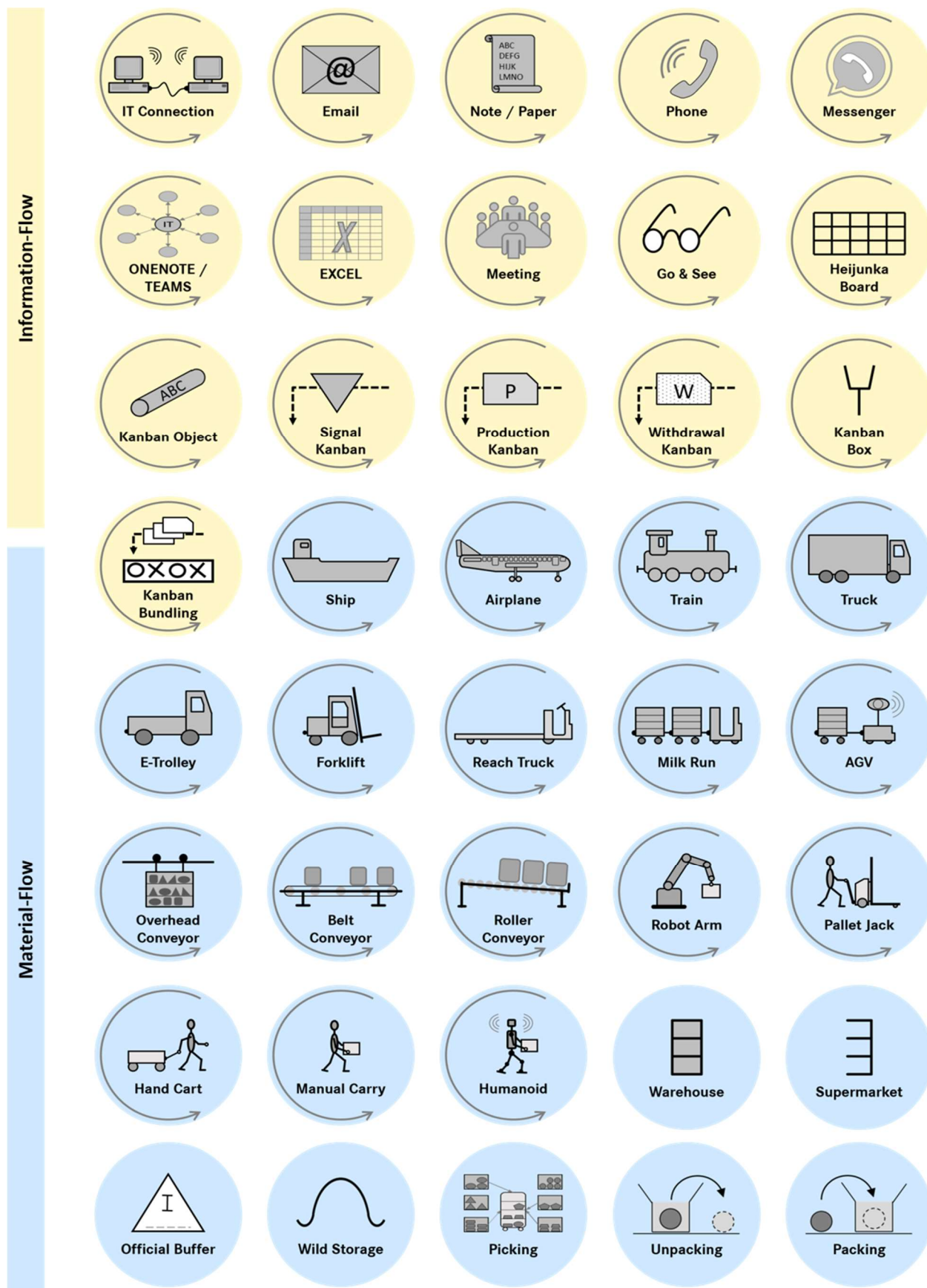
- 1) For more than 20 years I have been a consultant for process improvement, product design and people development in industry and medium-sized companies. More about me and my way of working can be found at www.sws4innovation.net.
- 2) Almost all projects are about becoming more effective and efficient, increasing safety, quality and output, or reducing the use of resources. In short: the performance of an organization is to be increased.
- 3) This can only be achieved by improving the collaboration between people and machines, through products whose properties suit both customers and production, and through the way employees & managers think and act.
- 4) Collaboration is based on the division of labor and the flow of material / goods / products through the production areas – and on the flow of information that controls the workflow, ensures quality, analyzes customer requirements, develops products, etc.
- 5) If you want to improve this collaboration, you have to know the workflows, identify weak points / obstacles and bring in the practical experience of those involved.
- 6) The best method I know of for this is: to depict the workflow graphically as a flow of material and information together with those involved, and to record all relevant problems. It is important to record only the details that are relevant to the desired improvement.
- 7) This diagram should be easy for everyone involved to create and understand – and it should be used again and again in the improvement project as a basis for discussions. It often also makes sense to have one diagram each of the current situation and the target situation.
- 8) Over the years, the "value stream with typical symbols" for production areas and the "swimlane diagram" for administrative areas have become established for this purpose. In addition, there are other standardized process diagrams from the QM and IT areas.
- 9) These value streams and swimlanes are often created with Post-its on brown paper. This is good because it is simple and quick, and the participants can also get involved hands-on. However, this also leads to difficulties & time expenditure if ...
 - the project team does not physically work in 1 location
 - changes are to be made to the diagram
 - many components from the current situation are to be duplicated for the target situation
 - entries / numerical values from the process boxes are to be transferred manually to Excel
- 10) Conclusion: It would be an advantage for everyone involved to be able to create the diagram in simple & practical software without software training, software that builds on the standards of Mike Rother's "Learning to See" and improves them further. In this way, we promote cross-departmental exchange about processes and a shared understanding of the process flows including their problems, and we lay a foundation for improving the processes together.
→ That is exactly why I programmed the SWST Value Stream Tool. And as a consultant for process improvement, product design and people development, I support managers & employees in improving their processes and creating a culture of improvement in which innovations emerge.

Questions & Suggestions and Problem Reports:

- If users have questions, suggestions or problems, they can contact me at: swst@sws4innovation.net

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Overview of Connector/Diamond Symbols in the SWST Value Stream Tool (circular arrow = pull; for some types of transport/activities represented by the symbols, pull or push makes no sense):



PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Registration and Licensing

- 1) This software was programmed in Python and is offered as an executable EXE file and as a setup EXE file for Windows. It runs without an internet connection, does not send any data and does not require any rights. Only during registration and licensing does the software prepare an email in your default email program, which must then still be sent manually.
- 2) I am of the opinion that you should be able to try out software before buying it, without restrictions and without any obligation to register or license it. Work with it and share the software and your user experiences directly with friends and colleagues.
- 3) The license-free trial version can be used free of charge for a defined period and is identified as such in the header bar together with the license expiry date/usage period. Registration or login is not required for this. At startup, only a popup window opens with a reminder of the usage period and the subsequent restricted use. This reminder can simply be clicked away.
- 4) Registration is optional and free of charge. It makes it possible to inform users about software updates and usage tips. Only an active email address is required for registration; further details are optional. Registration is done by sending a prepared email. → See main menu "Register SWST software".
- 5) The licensed full version is subject to a fee, limited in time and tied to the email address and the computer. The usage period can be defined by the user during licensing. Only the email address, the computer number and the usage period are required for licensing. Licensing is done by sending a prepared email. For simplicity, 1 month = 30 days, and 3 days are added to compensate for processing time. When an existing license is extended, the new duration is added to the existing duration.
→ See main menu "License SWST software".
- 6) Various options (e.g. bank transfer, PayPal) can be used to pay the license fees. Payment takes place entirely outside this software. The payment methods may change. After receipt of payment, users are sent the individualized license key (tied to the email address and the computer) together with an invoice by email.
- 7) Entering the correct license key extends the usage period up to a defined license expiry date (= licensing date + license duration + 3 days). Only then do the license email and the license information "Full License (until YYYY-MM-DD)" appear in the header bar, and the license expiry date and license key are displayed in the popup window for entering the licensing data. → See main menu "License SWST software".
- 8) In the popup window for entering the licensing data, the computer number of the current computer and the license computer number are displayed. Both numbers are the "MachineGuid" from the registry shortened to 20 characters and must match. This "MachineGuid" is a software-side identifier of the operating system instance. According to Microsoft, it changes with a new installation of Windows or a major feature upgrade. Should the user change computers during the license period or upgrade, e.g., from Win10 to Win11, please contact us via swst@sws4innovation.net so that a new license key can be created.
- 9) There may be free or paid updates in the future. Installing updates is not mandatory.

PDF Explanations about the "SWST Value Stream Tool" (for version 2.43)

Terms of Use and Privacy

- 1) The program has matured over the years during my work in improvement projects. It is based on my practical experience and wishes – and on my skills as a hobby programmer.
- 2) The program serves only to depict workflows or processes in value streams / swimlanes. It has no additional properties or functions whatsoever. It is ad-free and (except for registration and licensing) does not require an internet connection. It also deliberately does without options for simultaneous editing by several users, which would require cloud storage and unnecessarily increase the complexity of the software.
- 3) I accept no responsibility for the application / use / data storage, etc. As with all software programs, it cannot be ruled out that a malfunction may occur during use and that the program may freeze/crash. As a precaution, users should save their work frequently and not work too hastily.
- 4) The data required for licensing is limited to the user's email address and the computer number shortened to 20 characters (= "MachineGuid" from the registry), as well as the details necessary for paying the license fees. I do not willingly / knowingly share this data with other persons or companies, except for licensing and payment processing.
- 5) License fees paid will not be refunded, even if the email address or the computer is changed. In justified exceptional cases, I will create a new license key.
- 6) For better readability, all descriptions here and in the program use non-gendered language.
- 7) The software currently offers the option of switching the language between German / English / Spanish. It will be extended to further languages if I receive corresponding feedback from users.
- 8) By using the software, you agree to the exclusion of any liability and accept these terms of use and the privacy policy.

Legal notice (imprint):

Dipl. Ing. Stefan Schüßler, Im Krautgarten 33, 76879 Bornheim, Germany

Phone: +49-6348-3267212; Email: swst@sws4innovation.net; Web: www.sws4innovation.net