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Dashboard Enhancements

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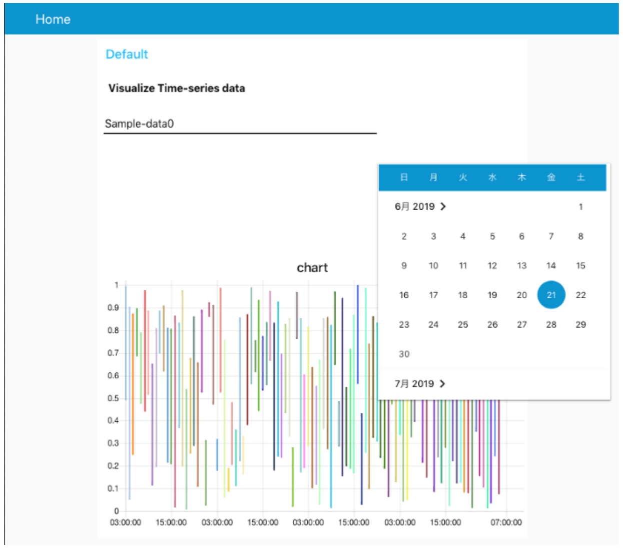
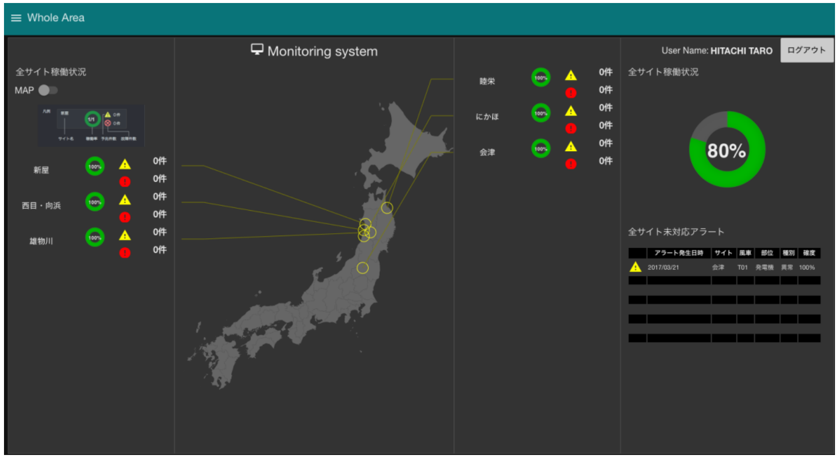
Background

- □ Graphical representation of data is effective tool for sharing knowledge among people.
- □ Node-RED Dashboard is convenient for creating GUI.
- □ But creating complex dashboard is difficult with current Node-RED dashboard.



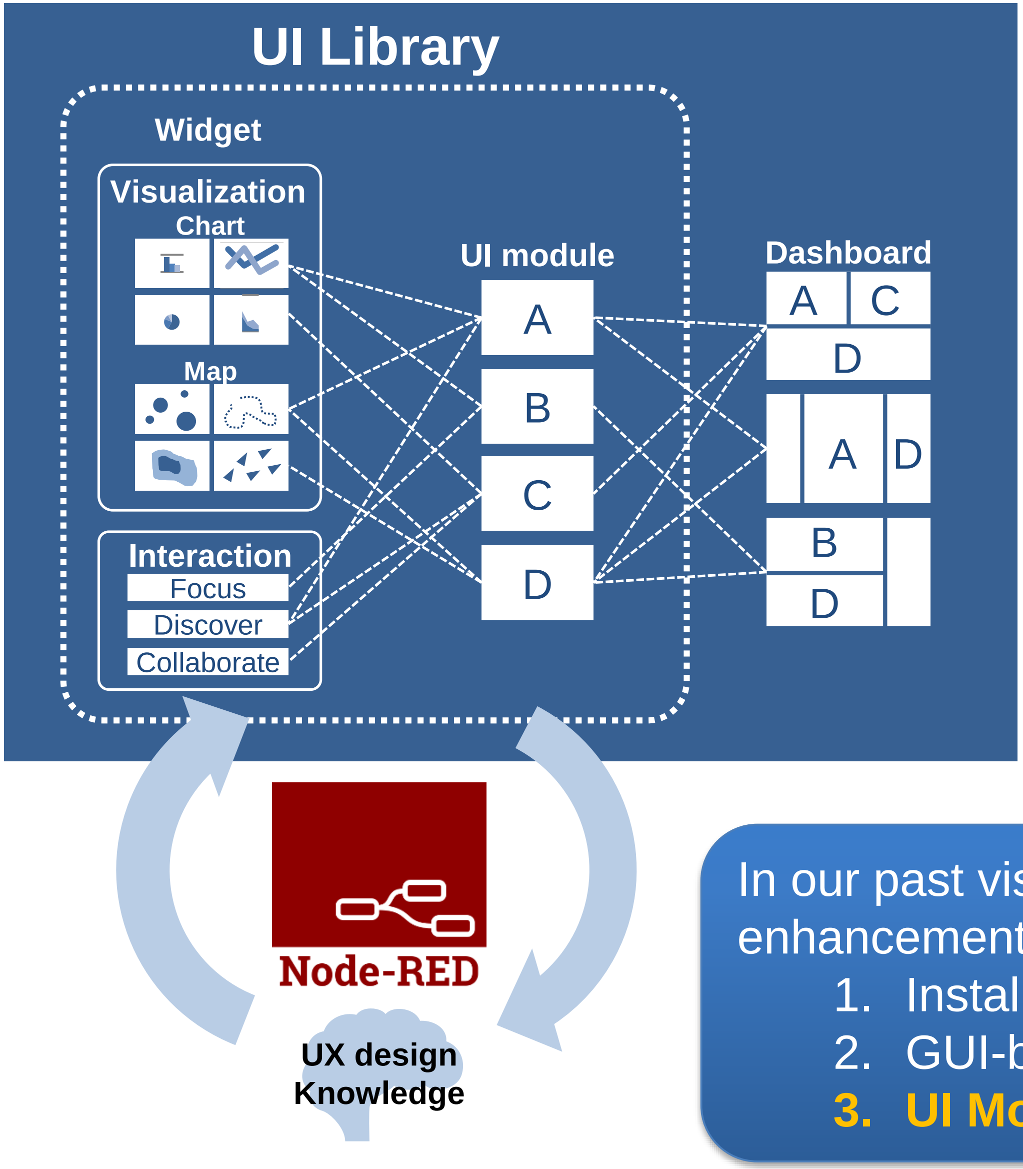
Simple Dashboard



	アラート発生日時	サイト	風車	部位	種別	確度
⚠	2017/03/21	会津	T01	発電機	異常	100%

Complex Dashboard

UI Library & Node-RED Dashboard Enhance



- **Widgets**
  Basic design elements that use charts and maps to represent data.

- **UI modules**
  Visual components made up of multiple elements.
  Each UI module is a group of widgets that meets a particular need in terms of the information it conveys or how it is viewed.

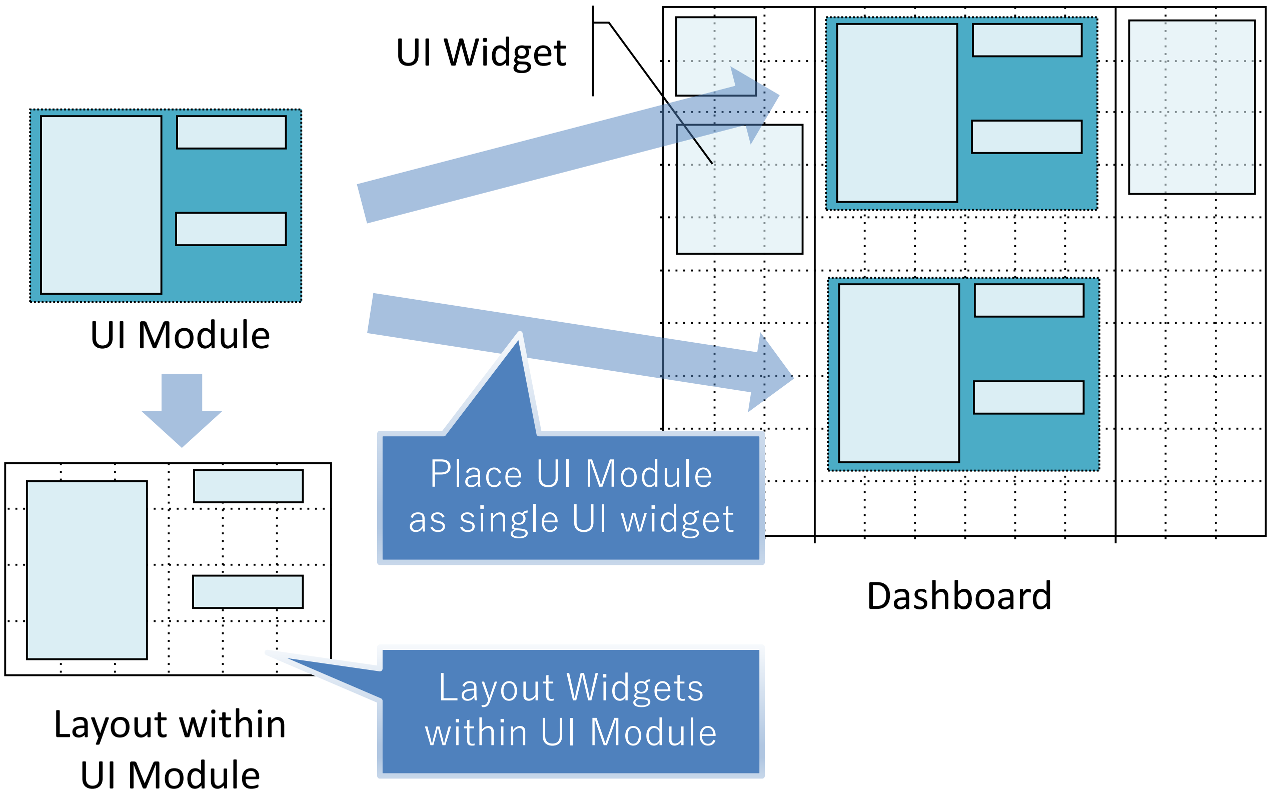
- **Dashboards**
  Dashboards that combine a number of UI modules in a predetermined layout.

In our past visit to Hursley, we discussed following enhancements on Node-RED Dashboard:

1. Installable Widgets (design elements)
2. GUI-based Layout Editing
3. **UI Module (Compound Widgets)**

UI Module (Compound Widget)

- □ UI module consists of a set of UI widgets. It has its own internal layout of containing widgets.
- □ UI modules can be placed on dashboard similar to UI widgets

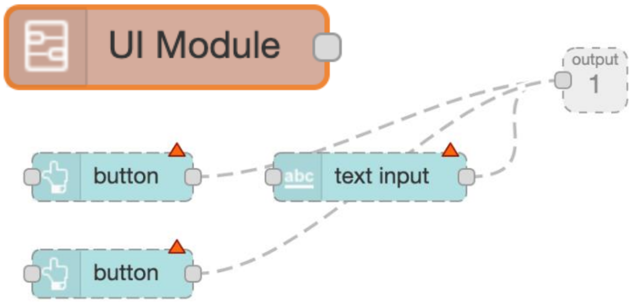


Place UI Module as single UI widget

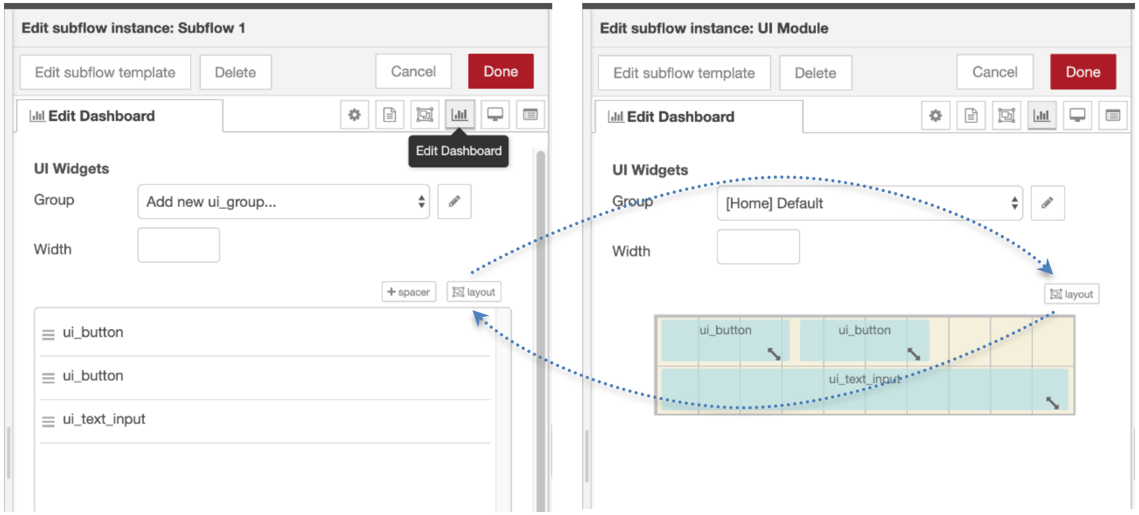
Layout Widgets within UI Module

Initial Proposal: SUBFLOW as UI Module

- UI Module is represented as a SUBFLOW that contains UI widgets
- SUBFLOW has interface to specify internal layout



UI Module (SUBFLOW) containing 3 widgets


Edit subflow instance: Subflow 1

Edit subflow template | Delete | Cancel | Done

Edit Dashboard

UI Widgets

Group: Add new ui_group...

Width:

+ spacer | layout

- ui_button
- ui_button
- ui_text_input

Edit subflow instance: UI Module

Edit subflow template | Delete | Cancel | Done

Edit Dashboard

UI Widgets

Group: [Home] Default

Width:

layout

(a) order mode

(b) layout mode

Settings Panel of UI Module

PROBLEM:
Node-RED(SUBFLOW) implementation should be independent of external node module (Node-RED dashboard).

Discussion on Last Visit to Hursley

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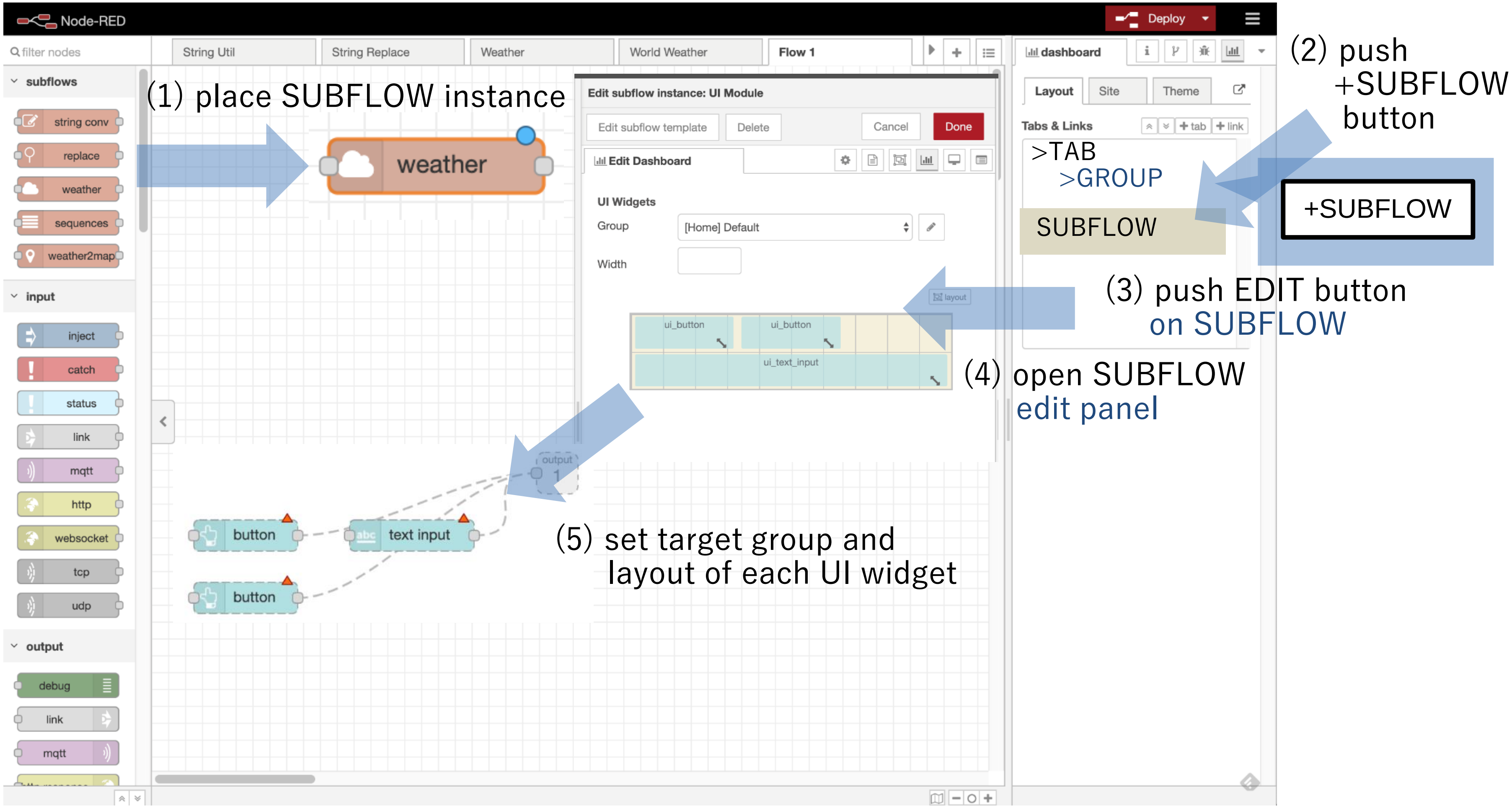
Discussed solution:
Add feature to edit layout of SUBFLOW UI Module instance to Node-RED Dashboard



(1) place SUBFLOW instance

(2) push +SUBFLOW button

(3) push EDIT button on SUBFLOW

(4) open SUBFLOW edit panel

(5) set target group and layout of each UI widget

Edit subflow instance: UI Module

Edit subflow template | Delete | Cancel | Done

Edit Dashboard

UI Widgets

Group: [Home] Default

Width:

Thoughts on the Latest Proposal

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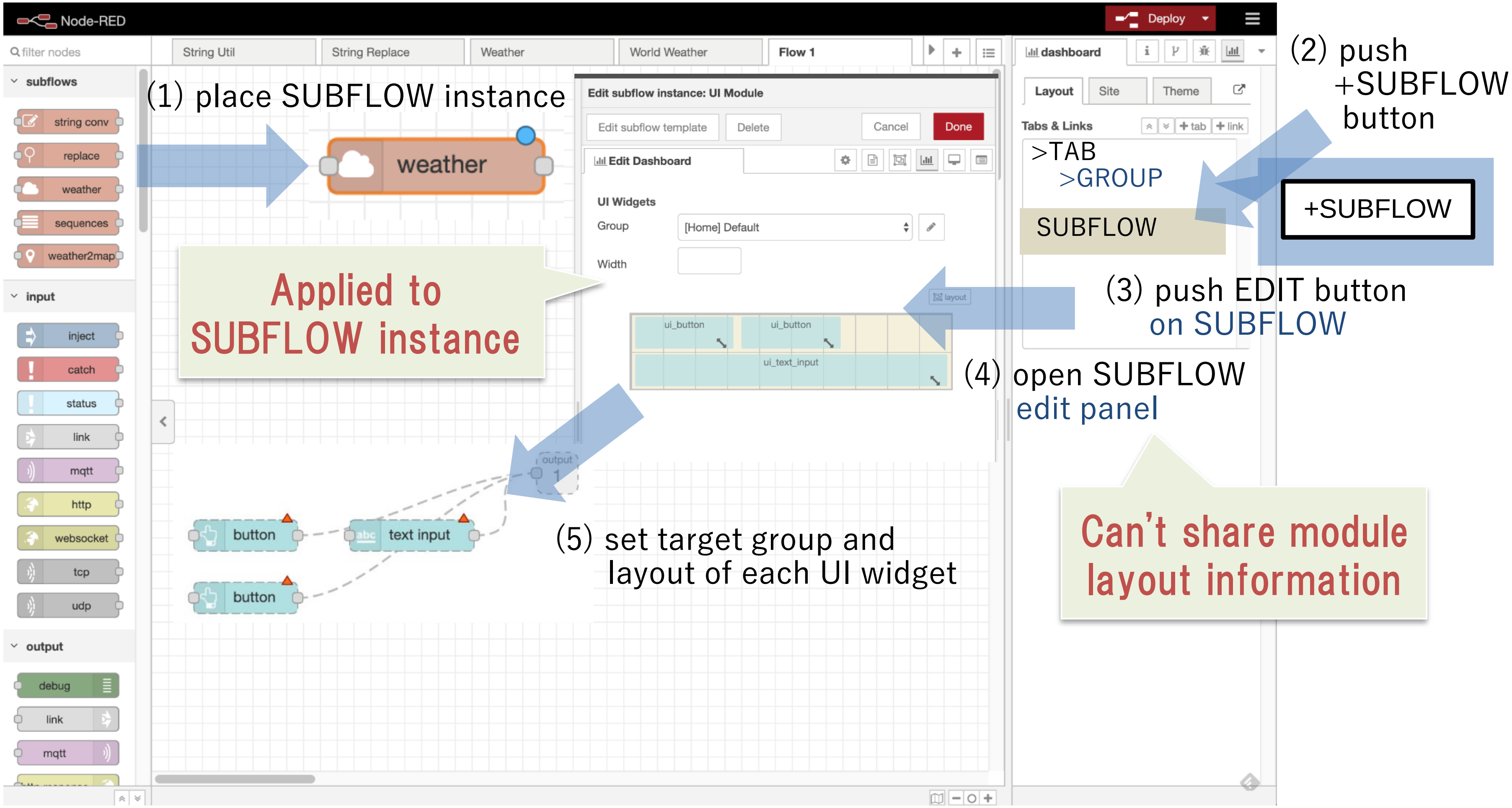
PROBLEMS:

- □ Can only be applied to SUBFLOW instance
- □ Can not share layout information among exported SUBFLOW users



(1) place SUBFLOW instance

Applied to SUBFLOW instance

(2) push +SUBFLOW button

(3) push EDIT button on SUBFLOW

(4) open SUBFLOW edit panel

(5) set target group and layout of each UI widget

Can't share module layout information

Edit subflow instance: UI Module

Edit subflow template | Delete | Cancel | Done

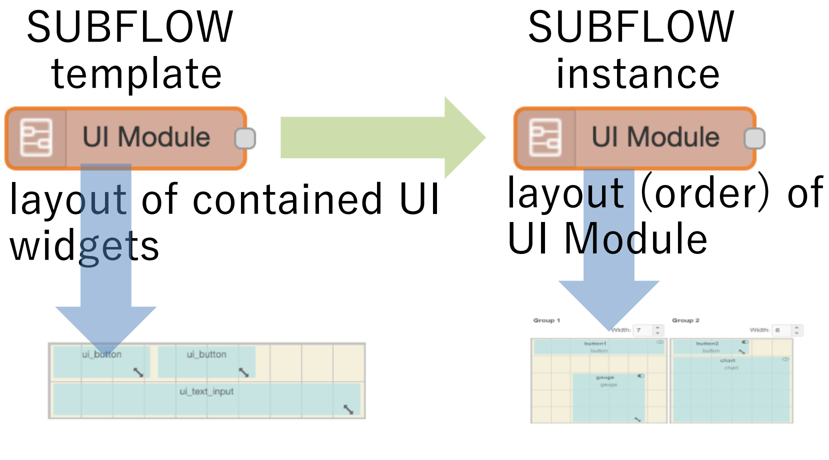
Edit Dashboard

UI Widgets

Group: [Home] Default

Width:

Proposals on UI Module layout


SUBFLOW template

UI Module

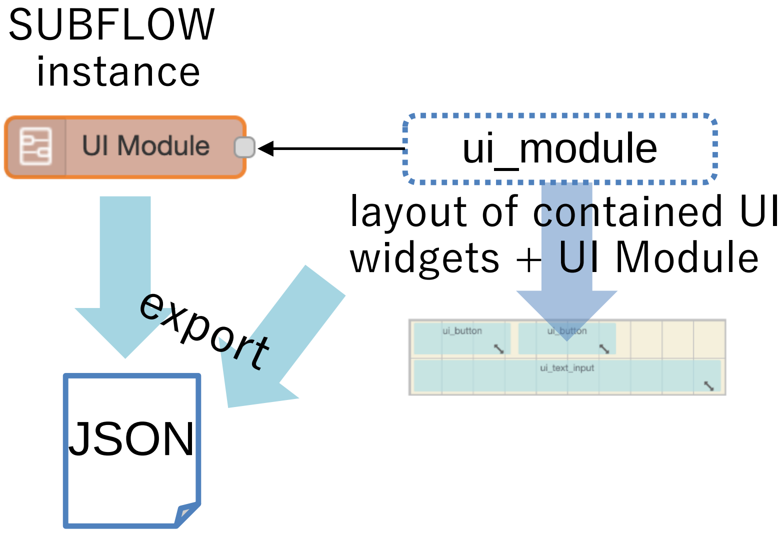
layout of contained UI widgets

SUBFLOW instance

UI Module

layout (order) of UI Module

(a) Extend SUBFLOW


SUBFLOW instance

UI Module

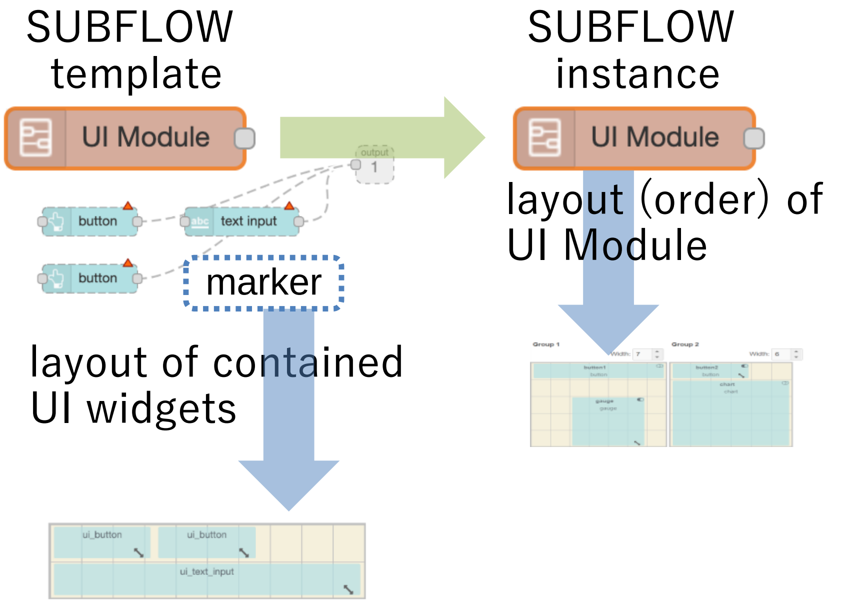
ui_module

layout of contained UI widgets + UI Module

export

JSON

(b) Extend Import/Export


SUBFLOW template

UI Module

marker

layout of contained UI widgets

SUBFLOW instance

UI Module

layout (order) of UI Module

(c) Use Marker Node

New Proposal: Extending SUBFLOW UI

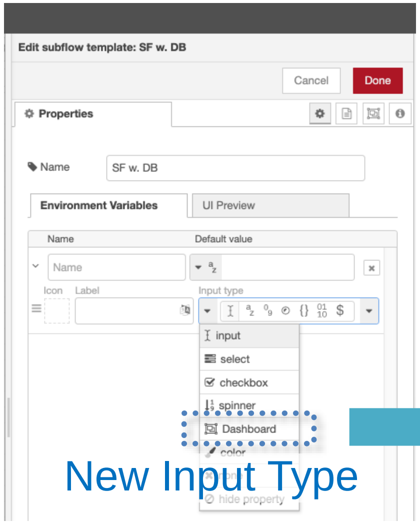
- □ Add an API for registering a new SUBFLOW env var type
- □ UI for UI module layout information is added using this interface.

Node-RED
Rumtime

Register input type on startup

RED.nodes.registerSubflowInputType(...)

Node-RED
Dashboard



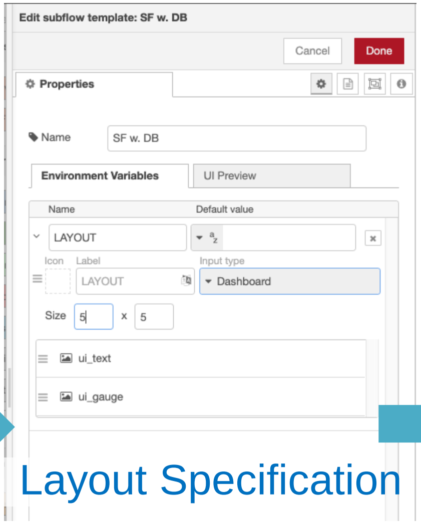
Edit subflow template: SF w. DB

Name: SF w. DB

Name	Default value
Name	

Icon / Label / Input type

New Input Type



Edit subflow template: SF w. DB

Name: SF w. DB

Name	Default value
LAYOUT	

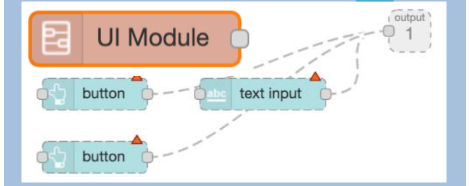
Icon / Label: LAYOUT / Input type: Dashboard

Size 5 x 5

- ui_text
- ui_gauge

Layout Specification

use instance



+

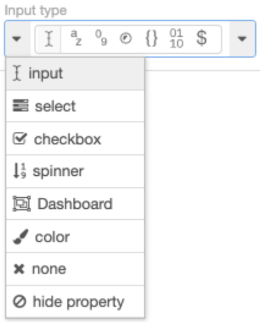
Layout Info
in env. var.

Nod-RED dashboard uses layout info. in env. var. for placing UI module

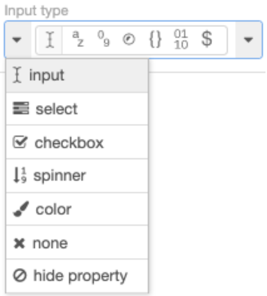
export as node
(UI module)

User-Defined SUBFLOW Input Type

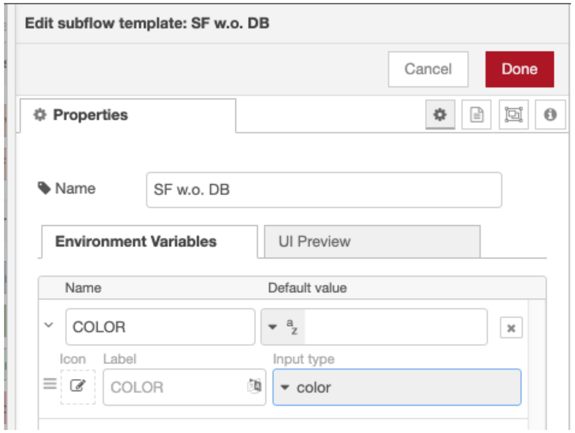
- □ Also useful for various kind of data input
- □ Allow selective activation based on SUBFLOW implementation (e.g. activate dashboard input item if SUBFLOW contains widget)



(a) w. dashboard



(b) w.o. dashboard

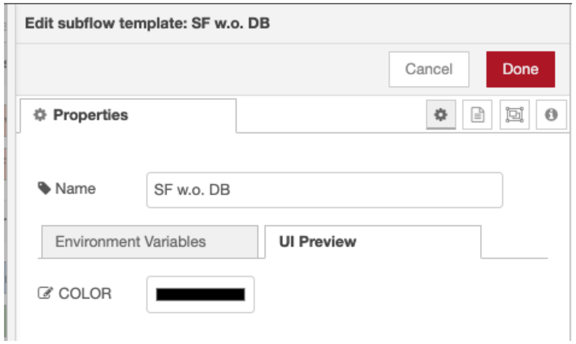

Edit subflow template: SF w.o. DB

Name: SF w.o. DB

Name	Default value
COLOR	

Icon | Label: COLOR | Input type: color

(a) COLOR input definition


Edit subflow template: SF w.o. DB

Name: SF w.o. DB

COLOR ■

(b) COLOR input UI

[DEMO] User-Defined Input Type

DEMO

Summary

- □ Proposed API for adding User-defined Type for SUBFLOW env. var.
- □ This allows dashboard layout information for SUBFLOW UI module
- □ This APIS also useful for other data input such as color, date, or others.

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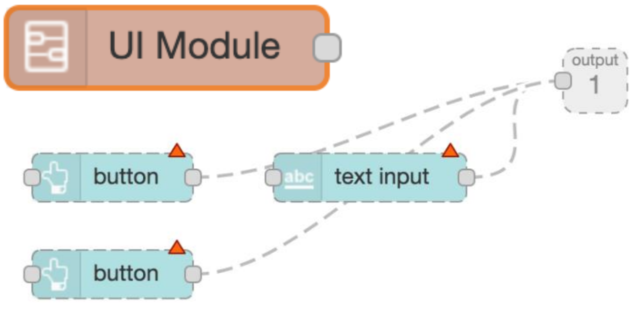
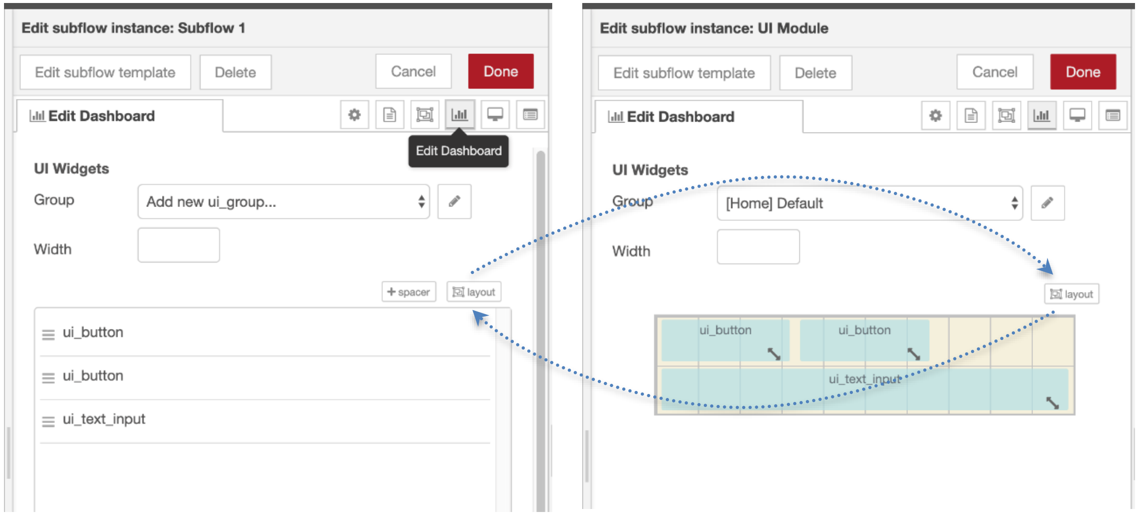
Proposal: SUBFLOW as UI Module

- ☐ Since UI Module consists of a set of nodes, using SUBFLOW as UI Module is natural extension
- ☐ Add interface to specify internal layout of SUBFLOW

- ■ UI Module (SUBFLOW) has "Edit Dashboard" Tab in settings panel.
- ■ It can specify group, width, and layout.
- ■ Layout can be switched between order-based layout and GUI-based layout (toggle by layout button).



UI Module (SUBFLOW) containing 3 widgets



Edit subflow instance: Subflow 1

UI Widgets

Group: Add new ui_group...

Width:

ui_button

ui_button

ui_text_input

Edit subflow instance: UI Module

UI Widgets

Group: [Home] Default

Width:

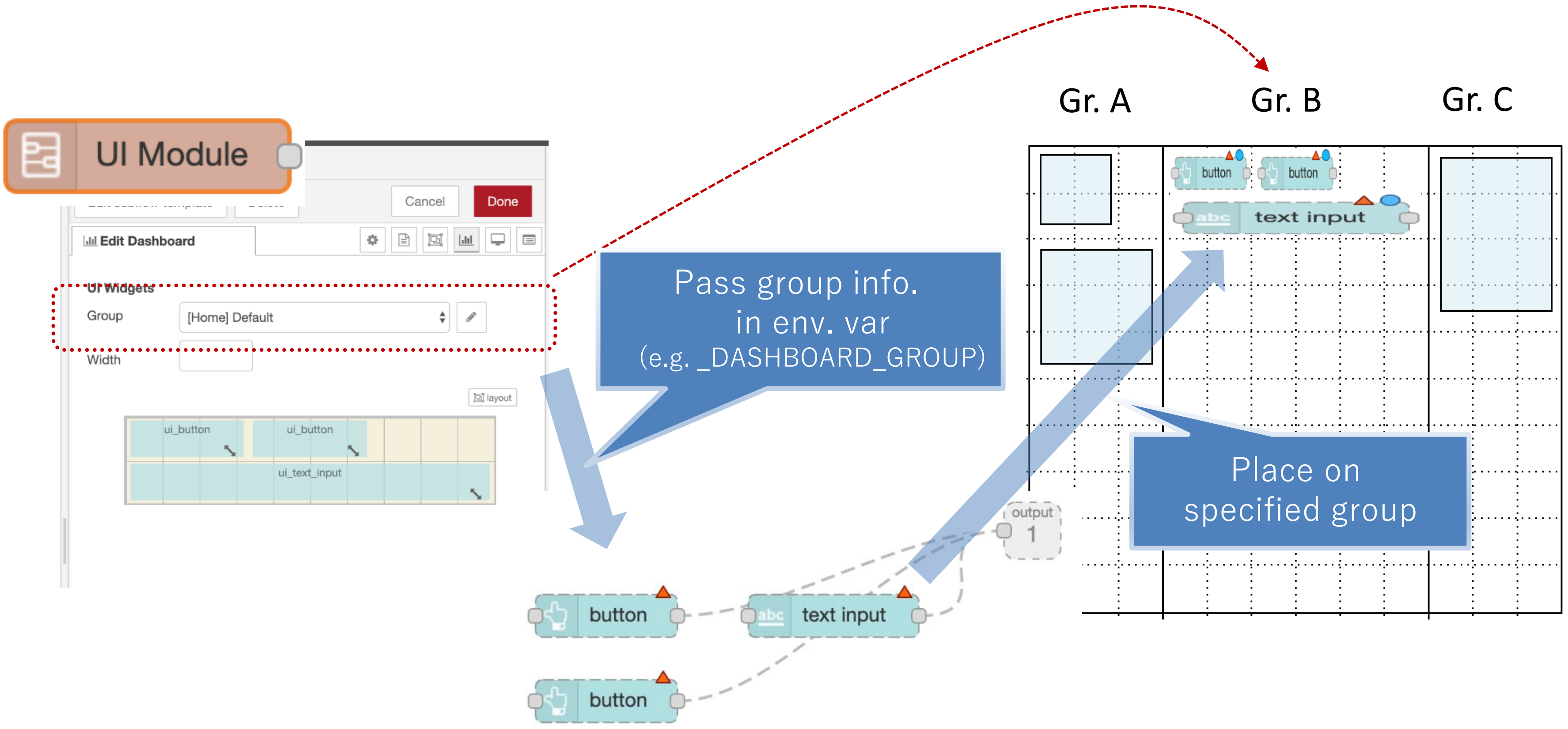
(a) order mode

(b) layout mode

Settings Panel of UI Module

Layout in Dashboard of UI Module

- □ UI Module appear as a widget in dashboard layout tab & tool.
- □ Group specification of widgets within UI Module is ignored but UI Module's group is passed by environment variable.



Edit Dashboard

UI Widgets

Group [Home] Default

Width

Pass group info.
in env. var
(e.g. _DASHBOARD_GROUP)

Place on
specified group

Example Usage: Specializing Vega Node

- □ By using SUBFLOW as UI Module, we can include some logic in UI Module
- □ One example of this usage is specialization of Vega node

- ■ Vega node accepts complex visualization specification in JSON
- ■ The JSON specification is sometimes difficult to write
- ■ Conversion from light-weight format to Vega specification is useful

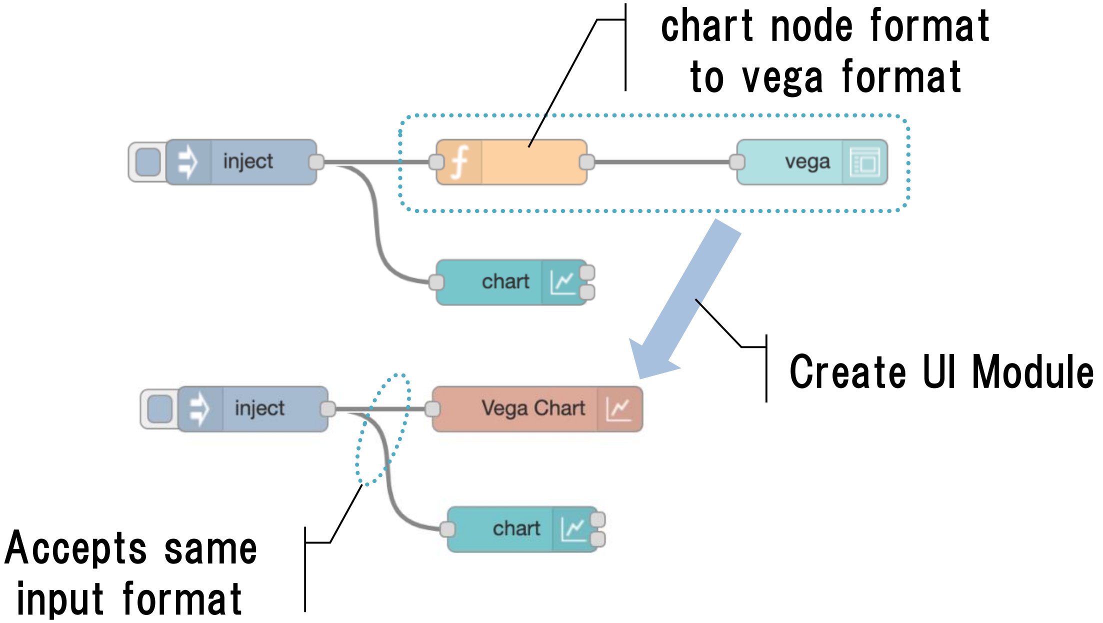


chart node format to vega format

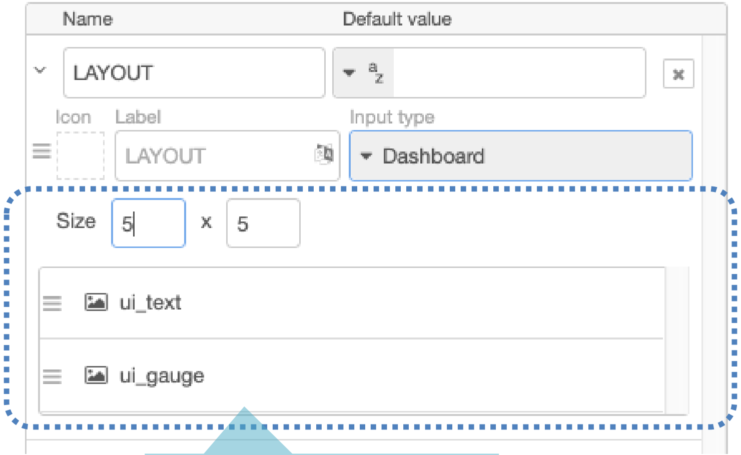
Create UI Module

Accepts same input format

registerSubflowInputType API

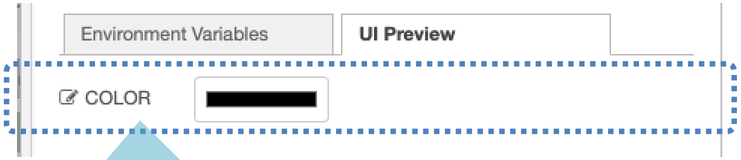
Specify following properties:

- ☐ Type name, Label, Icon, …
- ☐ UI for template definition, SUBFLOW env. var. input
- ☐ importing/exporting values



Name: LAYOUT
Default value:
Icon
Label: LAYOUT
Input type: Dashboard
Size 5 x 5
ui_text
ui_gauge

UI for template definition



COLOR

UI for SUBFLOW env. var. input