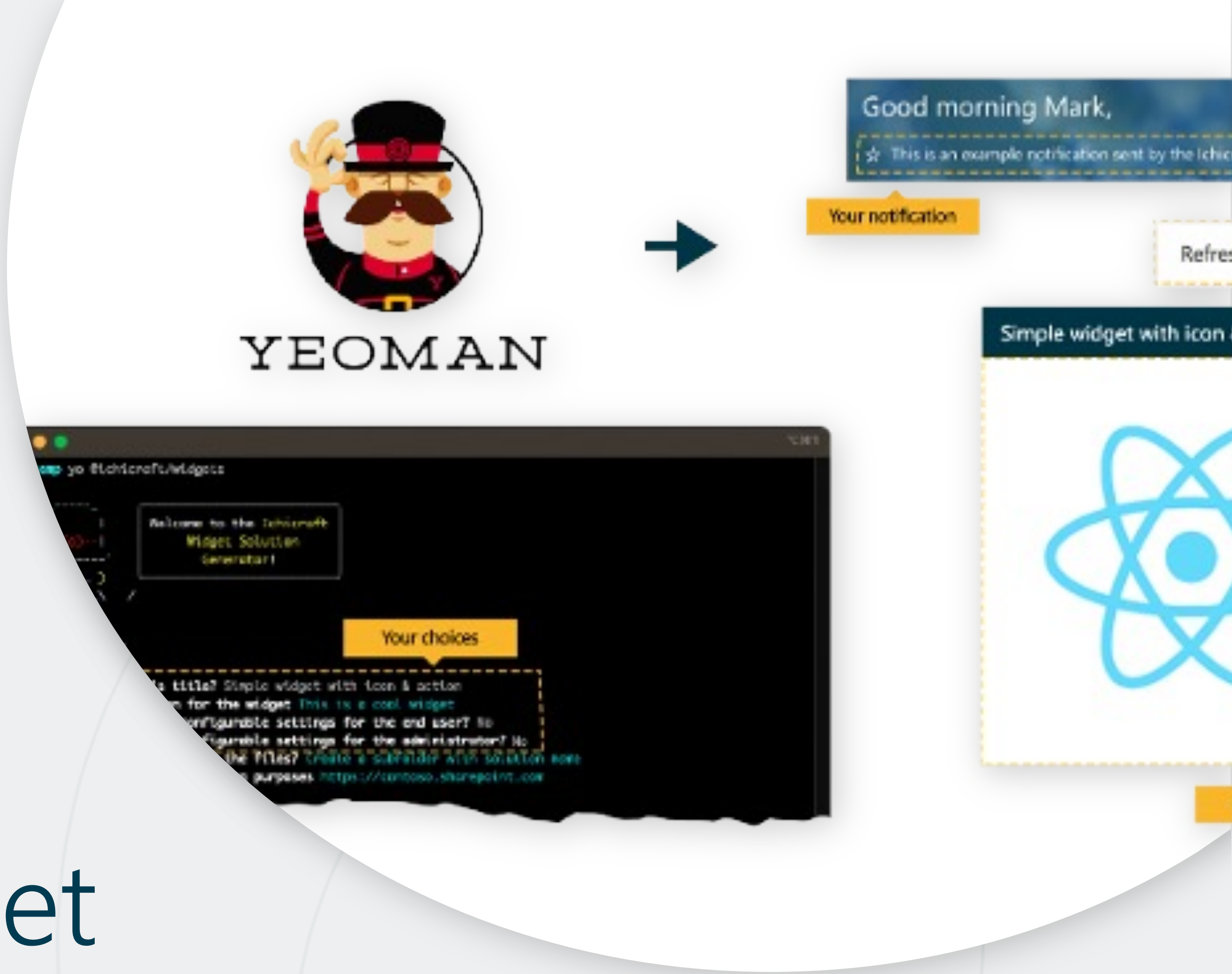

```
yo @ichicraft/widgets

Welcome to the Ichicraft
Widget Solution
Generator!

s title? Simple widget with icon & action
n for the widget This is a cool widget
onfigurable settings for the end user? No
figurable settings for the administrator? No
the files? Create a subfolder with solution name
purposes https://contoso.sharepoint.com
```

How to develop a widget

Version: 1.1
Last modified: 2022-01-31

Content

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01. Set up development environment (1/2)

Start by following set up steps as described by Microsoft SPFx team

https://docs.microsoft.com/en-us/sharepoint/dev/spfx/set-up-your-development-environment

In summary:

- Node.js + npm (latest version of Node.js LTS)
- Code editor (VS Code, Atom, Webstorm, etc.)
- Gulp (`npm install gulp --global`)
- Yeoman (`npm install yo --global`)
- Yeoman SharePoint generator (`npm install @microsoft/generator-sharepoint --global`)
- Modern browser (Edge Chromium, Chrome)

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01. Set up development environment (2/2)

Extra steps necessary for developing widgets:

- Yeoman Widgets generator (`npm install @ichicraft/generator-widgets --global`)
- To host widgets locally for debugging, trust self-signed developer certificate provided by SPFx (`gulp trust-dev-cert`). This can only be fired from generated SharePoint project.

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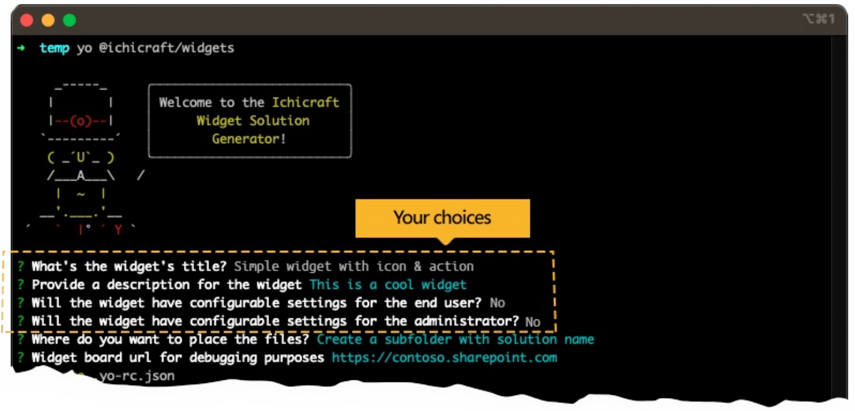
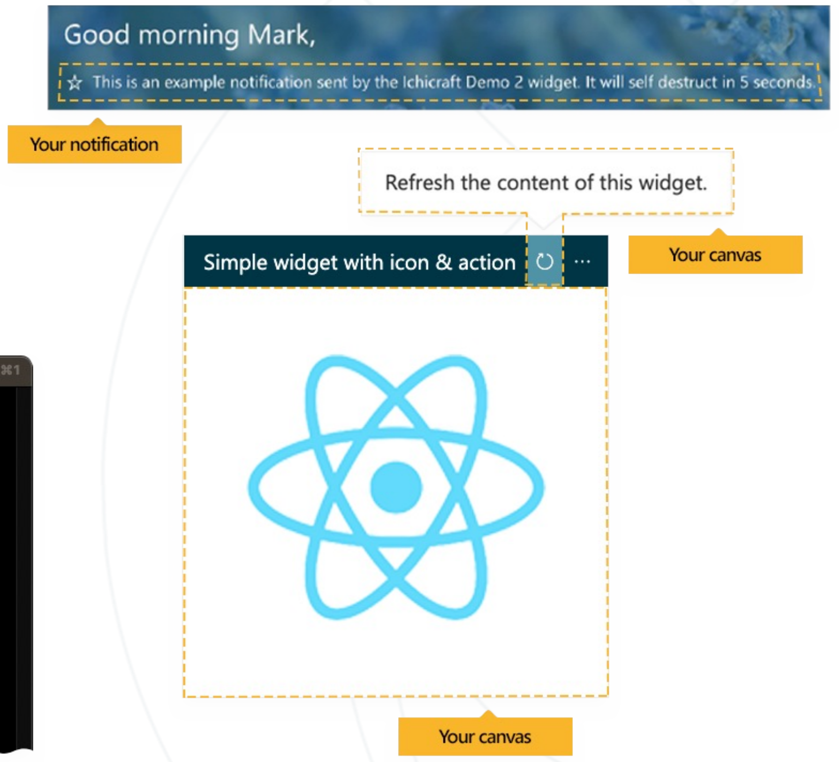
02. Building a simple widget



```
➜  temp yo @ichicraft/widgets

     _-----_     ╭──────────────────────────╮
    |       |    │ Welcome to the Ichicraft │
    |--(o)--|    │    Widget Solution       │
   `---------´   │     Generator!           │
    ( _´U`_ )    ╰──────────────────────────╯
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the widget's title? Simple widget with icon & action
? Provide a description for the widget This is a cool widget
? Will the widget have configurable settings for the end user? No
? Will the widget have configurable settings for the administrator? No
? Where do you want to place the files? Create a subfolder with solution name
? Widget board url for debugging purposes https://contoso.sharepoint.com
   .yo-rc.json
```



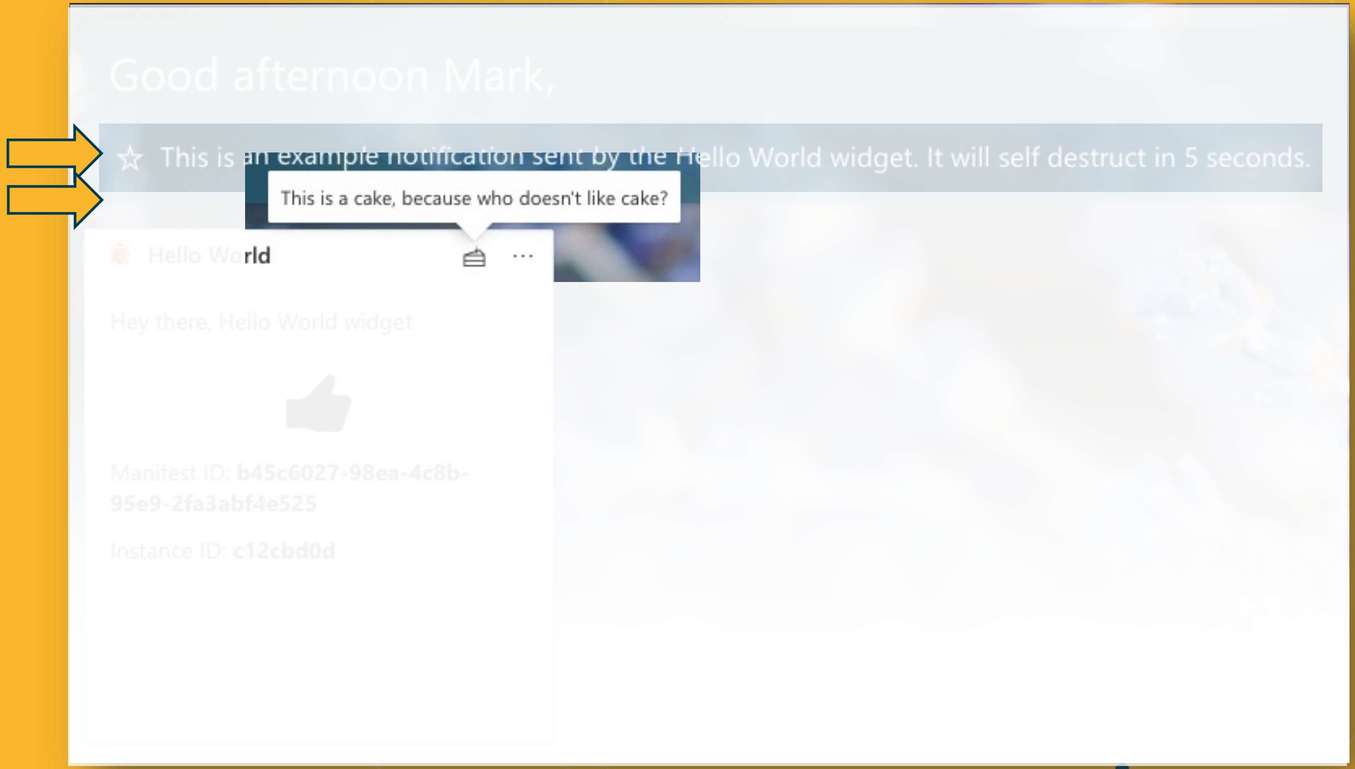
Good morning Mark,

☆ This is an example notification sent by the Ichicraft Demo 2 widget. It will self destruct in 5 seconds.

Your notification
Refresh the content of this widget.
Simple widget with icon & action
...
Your canvas
Your canvas

02. Build a simple widget

- Run the generator
  - Leave everything default, except last step: Widget board url
- Result: a simple widget without configuration options
- Notification example
- Custom CommandBar item example
- ‘`npm run start`’ to start debugging
  - ‘Hot reloading’ allows you to build and debug automatically



Good afternoon Mark,

This is an example notification sent by the Hello World widget. It will self destruct in 5 seconds.

This is a cake, because who doesn't like cake?

Hello World

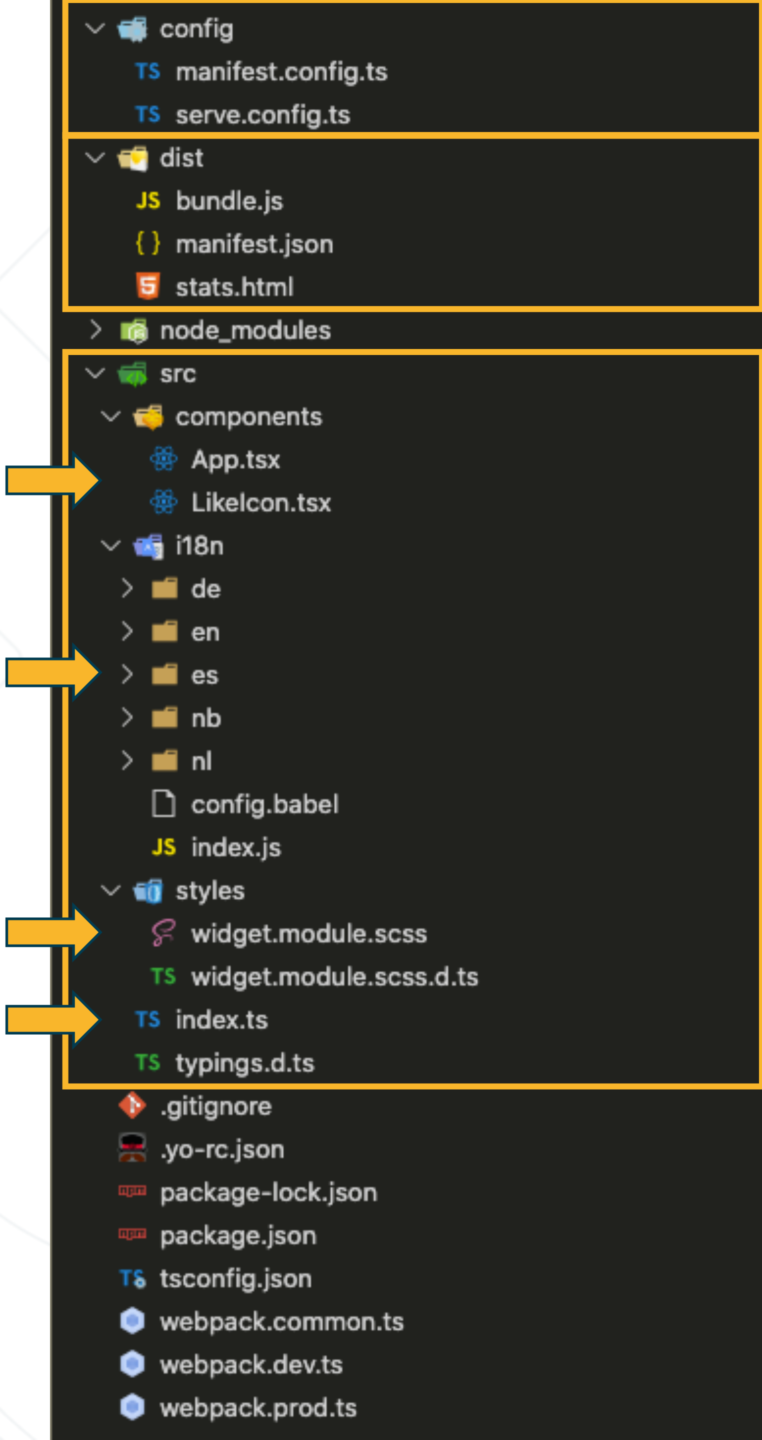
Hey there, Hello World widget

Manifest ID: b45c6027-98ea-4c8b-95e9-2fa3abf4e525

Instance ID: c12cbd0d

03. Widget project anatomy (1/3)

- The stack:
  - TypeScript by default
  - SASS for styling
  - i18next (+ react-i18next) library for internationalization (multilingual)
  - Webpack for bundling & local dev server
- Important folders
  - /config: configuration files for widget (manifest.config.ts) and local debugging (serve.config.ts)
  - /dist: build output for both local debugging and production builds
  - /src: actual source code for the widget
    - /src/index.ts (Widget base class)
    - /src/components/**/*.tsx (React components)
    - /src/i18n/**/* (Language resource files)
    - /src/styles/* (Sass style files)



```
config
  manifest.config.ts
  serve.config.ts
dist
  bundle.js
  manifest.json
  stats.html
node_modules
src
  components
    App.tsx
    LikeIcon.tsx
  i18n
    de
    en
    es
    nb
    nl
    config.babel
    index.js
  styles
    widget.module.scss
    widget.module.scss.d.ts
  index.ts
  typings.d.ts
.gitignore
.yo-rc.json
package-lock.json
package.json
tsconfig.json
webpack.common.ts
webpack.dev.ts
webpack.prod.ts
```

03. Widget project anatomy (2/3)

/src/index.ts -> ❤️ of the widget

- Extends **BaseWidget** class (like BaseWebPart in SPFx)
- Gives access to **widget context** (like Web Part context in SPFx)
- Allows overriding of various **'lifecycle' functions**, like
  - **`cleanupResources()`**: for cleaning up resources on unmounting
  - **`onInit()`**: for stuff that needs to happen before rendering
  - **`render(domElement: HTMLDivElement)`**: rendering the widget
  - *…other functions available if widget is 'configurable'*
- These functions are called by the Widget Board web part
- If functions aren't implemented/overridden, the widget might fail to render correctly (only render function is required).

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03. Widget project anatomy (3/3)

The widget context (type WidgetContext)

- Available in BaseWidget through `this.context`
- Provides (limited) access to web part context (`aadTokenProviderFactory`, `msGraphClientFactory`)
- Contains security related functions (e.g. `isCurrentUserMemberOfSPGroup(groupId)`)
- Information related to site and user (`language`, `userName`, etc)
- Widget related info and functionality, scoped by
  - `manifest`: everything related to widget (regardless of installation)
  - `definition`: everything related to widget variant, as configured by admin
  - `instance`: everything related to a single widget on a user's board

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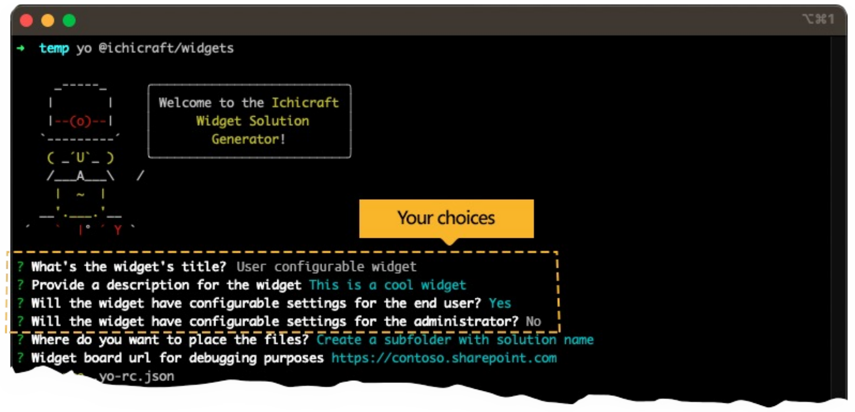
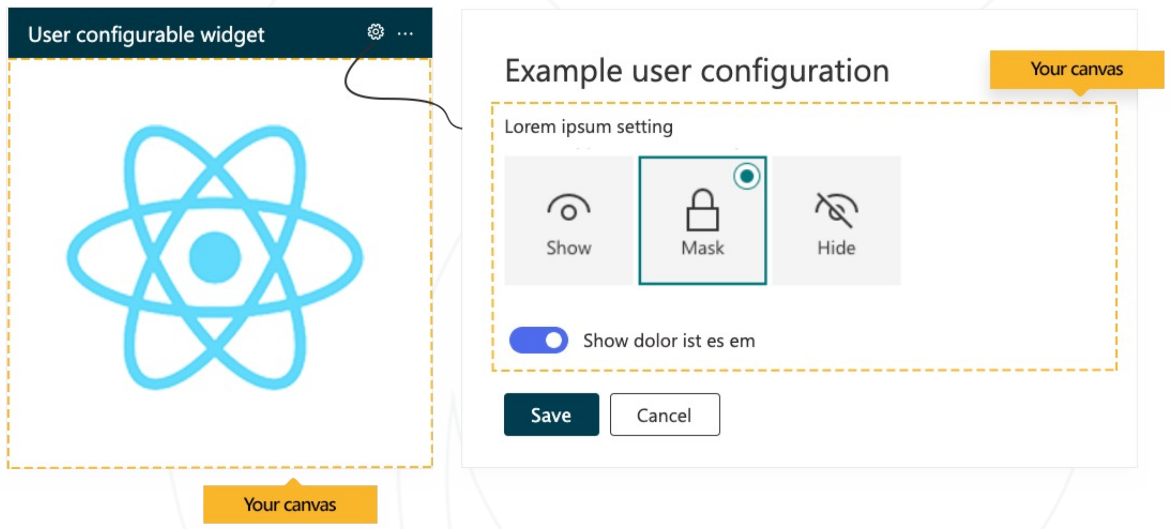
04. Build a configurable widget

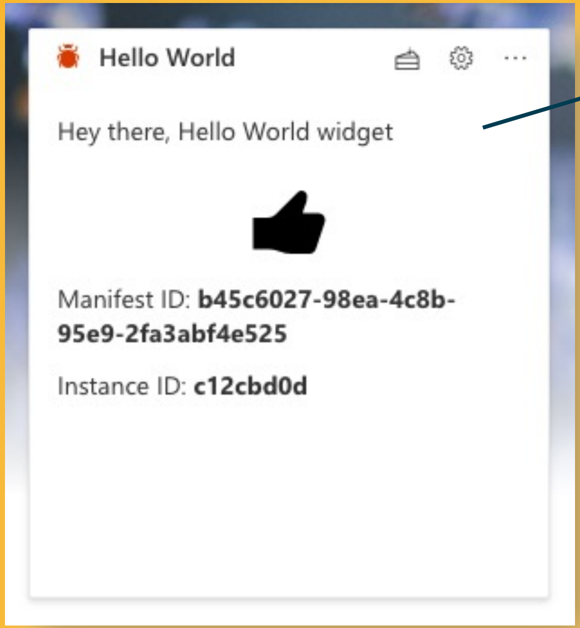


```
➜  temp yo @ichicraft/widgets

     _-----_     ╭──────────────────────────╮
    |       |    │ Welcome to the Ichicraft │
    |--(o)--|    │   Widget Solution        │
   `---------´   │     Generator!           │
    ( _´U`_ )    ╰──────────────────────────╯
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the widget's title? User configurable widget
? Provide a description for the widget This is a cool widget
? Will the widget have configurable settings for the end user? Yes
? Will the widget have configurable settings for the administrator? No
? Where do you want to place the files? Create a subfolder with solution name
? Widget board url for debugging purposes https://contoso.sharepoint.com
    yo-rc.json
```



04. Build a user configurable widget

- Run the generator
  - Will the widget have configurable settings for the end user? YES!
- Result: a user configurable widget
- '`npm run start`' to start debugging

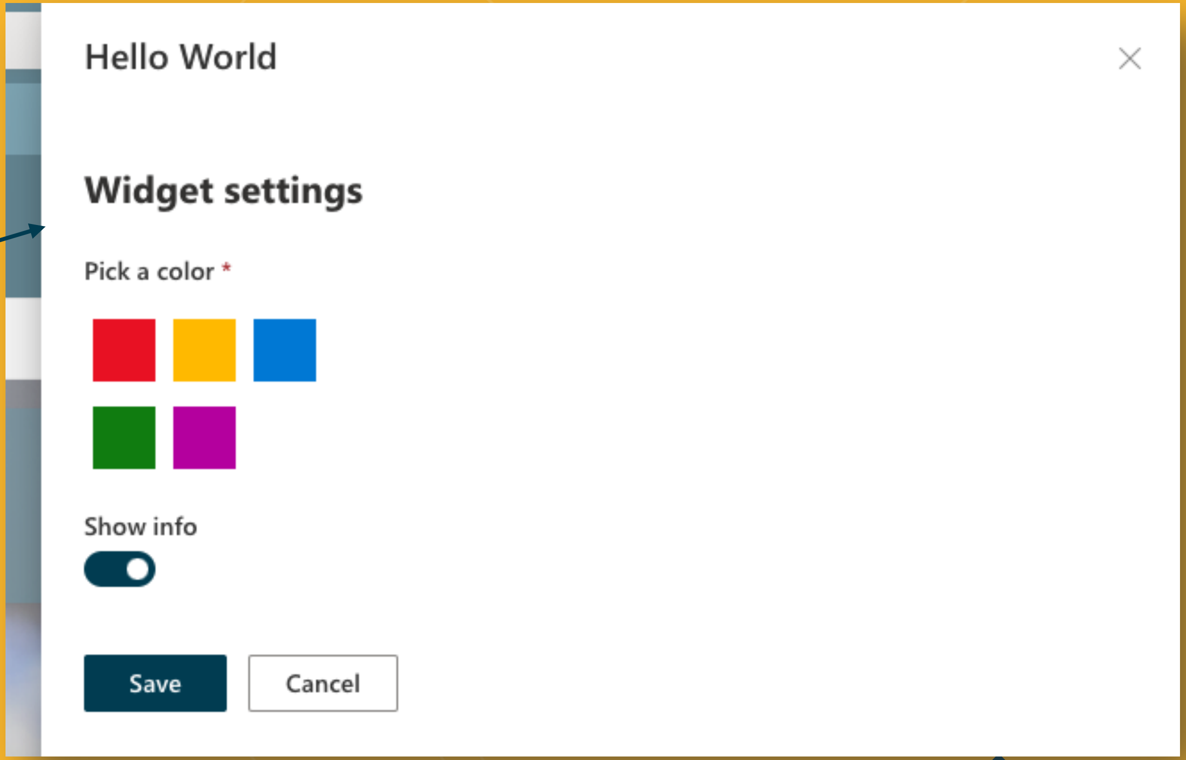


Hello World

Hey there, Hello World widget

Manifest ID: **b45c6027-98ea-4c8b-95e9-2fa3abf4e525**

Instance ID: **c12cbd0d**



Hello World

Widget settings

Pick a color *

🟥 🟨 🟦
🟩 🟪

Show info

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05. Project anatomy configurable widget

Configurable widgets need more overriding of various 'lifecycle' functions in widget base class implementation:

- `render[User|Admin]Configuration(domElement)`: functions to specifically render the configuration forms
- `validate[User|Admin]ConfigurationForm()`: functions called when user or admin tries to save configuration. Allows form validation before persisting configuration.
- `getSerialized[User|Admin]Configuration()`: functions to serialize the configuration for the widget board to persist.
- `verifyPersisted[User|Admin]Configuration(config)`: functions to verify if persisted configuration data is (still) correct.

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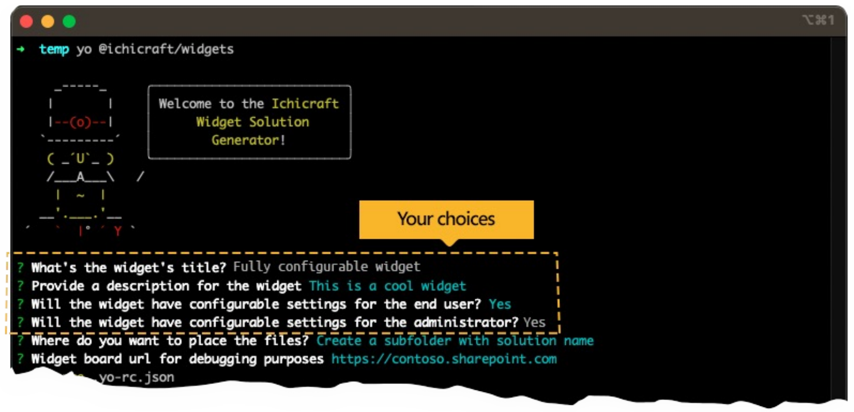
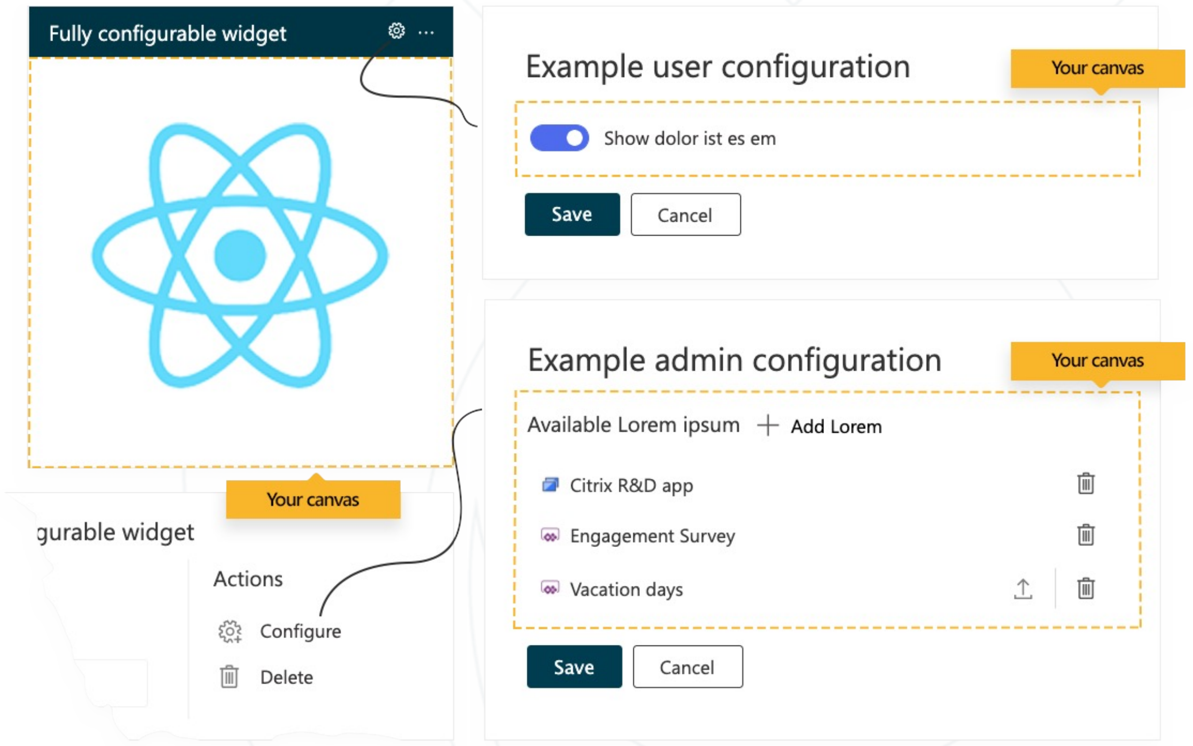
06. Build a fully configurable widget



```
→ temp yo @ichicraft/widgets

                   Welcome to the Ichicraft
                     Widget Solution
                       Generator!

? What's the widget's title? Fully configurable widget
? Provide a description for the widget This is a cool widget
? Will the widget have configurable settings for the end user? Yes
? Will the widget have configurable settings for the administrator? Yes
? Where do you want to place the files? Create a subfolder with solution name
? Widget board url for debugging purposes https://contoso.sharepoint.com
   yo-rc.json
```



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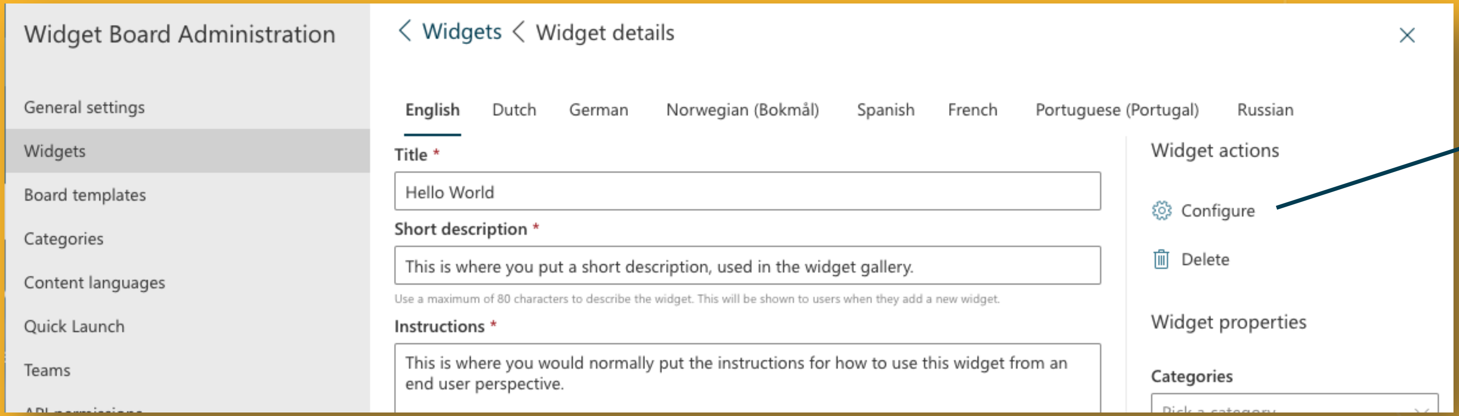
06. Build a fully configurable widget

- Run the generator
  - Will the widget have configurable settings for the end user? YES!
  - Will the widget have configurable settings for the administrator? YES!
- Result: a fully configurable widget
- ‘`npm run start`’ to start debugging



Widget Board Administration

General settings
Widgets
Board templates
Categories
Content languages
Quick Launch
Teams

< Widgets < Widget details

English | Dutch | German | Norwegian (Bokmål) | Spanish | French | Portuguese (Portugal) | Russian

Title *
Hello World

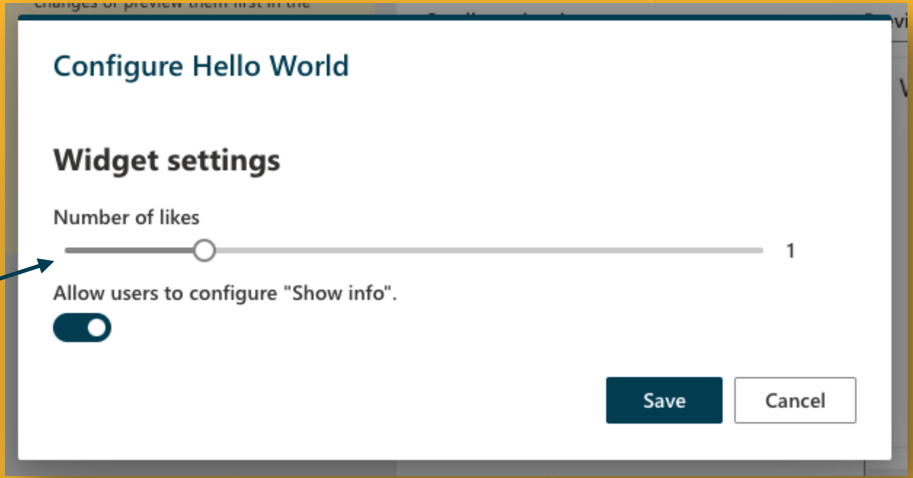
Short description *
This is where you put a short description, used in the widget gallery.
Use a maximum of 80 characters to describe the widget. This will be shown to users when they add a new widget.

Instructions *
This is where you would normally put the instructions for how to use this widget from an end user perspective.

Widget actions
Configure
Delete

Widget properties

Categories



Configure Hello World

Widget settings

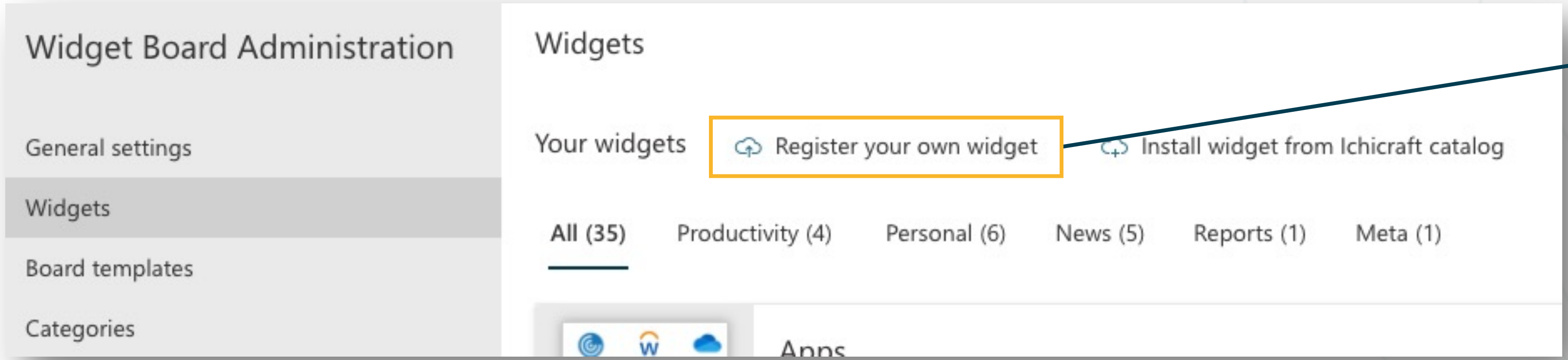
Number of likes: 1

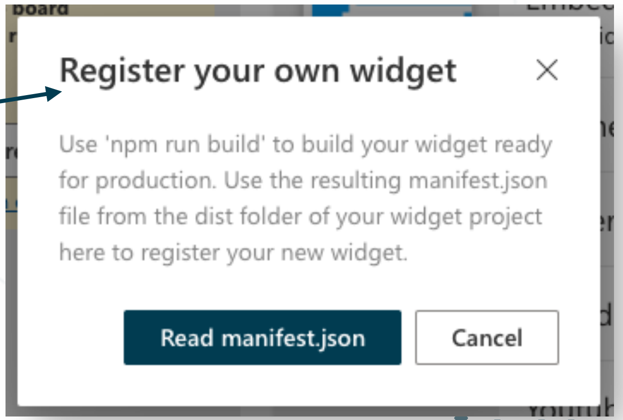
Allow users to configure "Show info".

Save | Cancel

07. Ready for production?

- Provide predicted script url in scriptUrl property in manifest.config.ts
- `npm run build` to make production ready bundle and manifest.json
- Host the **bundle.js** on a web server, CDN, SharePoint document library or a SP document library configured as CDN (https://docs.microsoft.com/nl-nl/microsoft-365/enterprise/use-microsoft-365-cdn-with-spo?view=o365-worldwide)
- Use **manifest.json** to register your own widget in the Widget Board Administration panel:

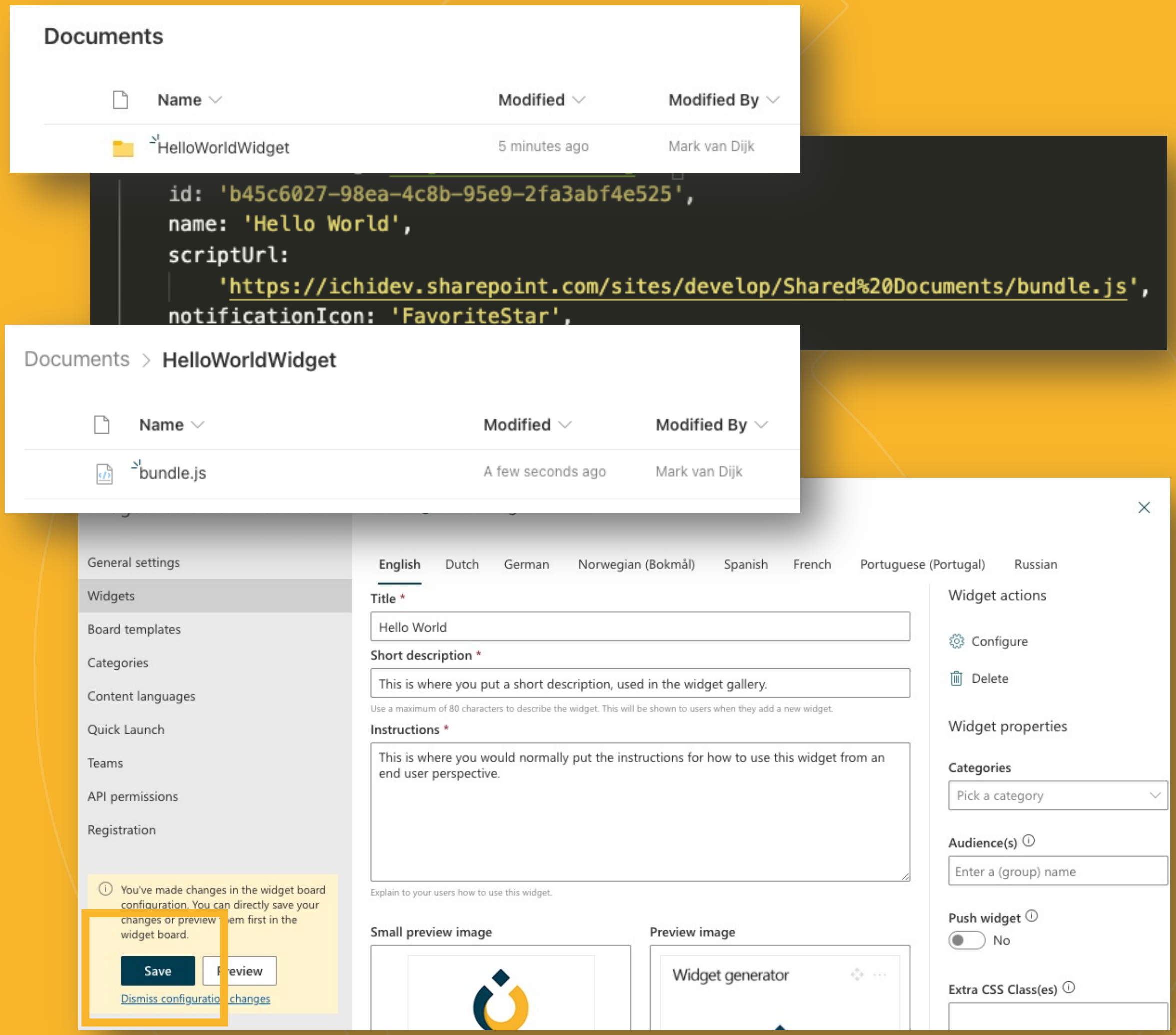




Use 'npm run build' to build your widget ready for production. Use the resulting manifest.json file from the dist folder of your widget project here to register your new widget.

08. Deploy widget

- Prepare default document library ‘Documents’ by creating a folder “HelloWorldWidget”
- Manually update manifest.config.ts by setting scriptUrl property to “[tenant].sharepoint.com/[yoursite]/Shared%20Documents/HelloWorldWidget/bundle.js”
- ‘`npm run build`’ to make production bundle
- Upload bundle.js to folder in document library
- Use manifest.json to register own widget
- Preview configuration
- Save (and persist)



Documents

Name	Modified	Modified By
HelloWorldWidget	5 minutes ago	Mark van Dijk

```
id: 'b45c6027-98ea-4c8b-95e9-2fa3abf4e525',
name: 'Hello World',
scriptUrl:
  'https://ichidev.sharepoint.com/sites/develop/Shared%20Documents/bundle.js',
notificationIcon: 'FavoriteStar',
```

Documents > HelloWorldWidget

Name	Modified	Modified By
bundle.js	A few seconds ago	Mark van Dijk

Title *
Hello World

Short description *
This is where you put a short description, used in the widget gallery.
Use a maximum of 80 characters to describe the widget. This will be shown to users when they add a new widget.

Instructions *
This is where you would normally put the instructions for how to use this widget from an end user perspective.
Explain to your users how to use this widget.

Small preview image

Preview image

Widget actions
Configure
Delete

Widget properties
Categories: Pick a category
Audience(s): Enter a (group) name
Push widget: No
Extra CSS Class(es)

You've made changes in the widget board configuration. You can directly save your changes or preview them first in the widget board.

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