

Case studies - Gabriel Agu

Selected case studies from the past 2 years:

Scaling up component viewer

Migrating the reservation details to the design system

Iconography at Booking

Scaling the component viewer

The context

In early 2017, the team I was in released the first version of the design system foundational layers - color, typography, units and iconography. Our next milestone was to create a comprehensive set of web components for the design and engineering team at Booking.

We released the first version of plain HTML/CSS components in late 2017, along with a basic web page with the list of all components with variants, code snippets and implementation notes.

[See larger view of the initial version](#)

The screenshot shows a design system component library interface. On the left, there's a sidebar with a dropdown menu set to '7.4.4' and a list of components: Layout, Depth, Grid, Layout, Utilities, Components, Accordion, Action bar, Alert (which is highlighted in blue), Avatar, Avatar block, Badge, Banner, and Breadcrumb. The main area has a title 'Alert' and a subtitle 'Dependencies: button, link'. Below this, there are two sections: 'SUCCESS LARGE' and 'SUCCESS DEFAULT'. Each section contains a green box with a checkmark icon and the text 'Your booking is confirmed'. Underneath each box is a snippet of HTML/CSS code. At the bottom of each section is a link labeled 'Review payment details'.

SUCCESS LARGE

Your booking is confirmed
We've sent your confirmation email to booker@booking.com
[Review payment details](#)

```
<div class="bui-alert bui-alert--success bui-u-bleed@smal" role="status">
  <span class="icon-hint bui-alert__icon" role="presentation">
    <TMPL_HELPER icon name="iconset/checkmark_selected" class="" width="24" role="presentation">
  </span>
<div class="bui-alert__description">
  <span class="bui-alert__title">Your booking is confirmed</span>
  <p class="bui-alert__text">
    We've sent your confirmation email to booker@booking.com
  </p>
  <a href="#" title="Solve problem" class="bui-link bui-link--primary">
    Review payment details
  </a>
</div>
</div>
```

SUCCESS DEFAULT

Your booking is confirmed. We've sent your confirmation email to booker@booking.com

```
<div class="bui-alert bui-alert--success bui-u-bleed@smal" role="status">
  <span class="icon-hint bui-alert__icon" role="presentation">
    <TMPL_HELPER icon name="iconset/checkmark_selected" class="" width="24" role="presentation">
  </span>
<div class="bui-alert__description">
  <span class="bui-alert__title">Your booking is confirmed</span>
  <p class="bui-alert__text">
    We've sent your confirmation email to booker@booking.com
  </p>
  <a href="#" title="Solve problem" class="bui-link bui-link--primary">
    Review payment details
  </a>
</div>
</div>
```

The problem

The initial web page showcasing the components and their documentation was created to render in an easy way the implementation of the HTML/CSS components. In the following months, we added multiple implementations of those components in React, Vue and HTMLOTemplate (legacy Perl-based templating). The initial version did not provide an ability to switch between those implementations, which meant maintaining multiple tools to showcase them.

Additionally, the initial version provided a list of all variants of any component, along with example code for each of them, which, in the cases of components with multiple variants and sizes, made it a very difficult area to navigate (for instance, the *alert* component has two sizes and 4 variants, which meant displaying 8 screenshots and blocks of code in the page).

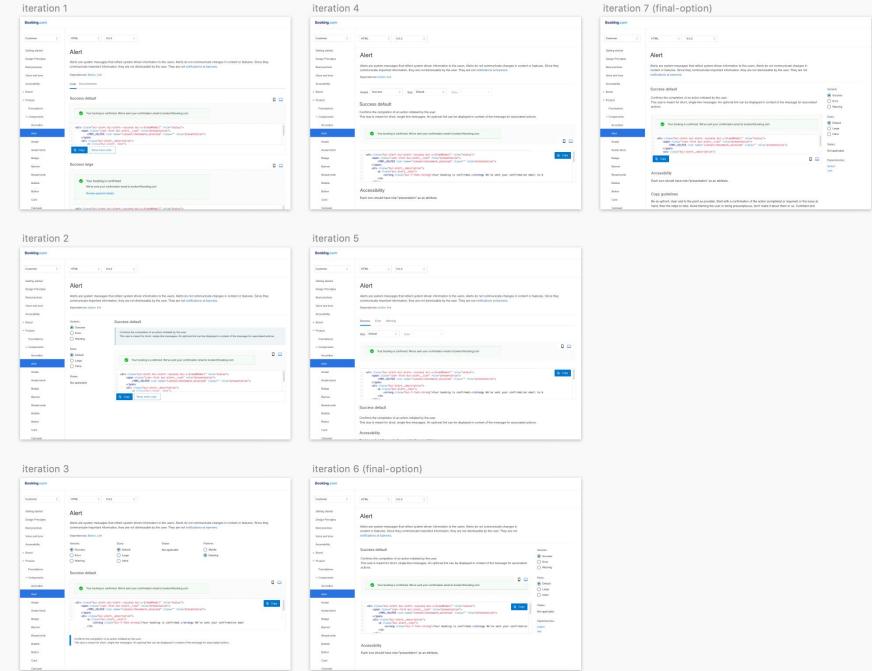
One of the most requested features was a “click-to-copy-code” button, to allow engineers to copy over code to their editor.

The process

After researching various component viewer implementations from other design systems (Polaris from Shopify, Material from Google, Lightning from Salesforce, and so on), and aiming to improve navigation between variants and sizes, I created a series of drafts.

The variations in the drafts featured various methods of toggling between component variant and size.

See large view of iterations: [#1](#), [#2](#), [#3](#), [#4](#), [#5](#), [#6](#), [#7](#)



The outcome

After exploring options like having tabs for each component, with sub-navigation for sizes, or having a central configuration for size and variants area, the most straightforward choice was a sidebar with radio buttons for size and variant, which was easy to read and would allow the main content area to focus on displaying the selected component size and variant.

The screenshot shows a component documentation page for 'Booking.com'. On the left, there's a sidebar titled 'Size and variant selection' with radio buttons for 'Variant' (Success, Error, Warning) and 'Size' (Default, Large, Small). Below these are sections for 'Not applicable' and 'Dependencies: button, link'.

The main content area has several sections:

- Framework and version switch:** Shows 'HTML' and '6.0.2'.
- Component usage information:** Shows 'Alert'.
- Size and variant information:** Shows 'Success default'.
- Size and variant preview:** Shows a preview of an alert message: 'Your booking is confirmed. We've sent your confirmation email to booker@booking.com'.
- Code snippet:** Shows the HTML code for the alert component.
- Full implementation specs:** Shows 'Accessibility' with the note 'Each icon should have role="presentation" as an attribute.'

The outcome

New features in the updated version of the component viewer:

- switch between framework implementations and versions
- more information on recommended component usage
- selection for size and variant to expose variants and sizes available
- toggling between mobile and desktop view for selected component variant and size
- copy button for code snippets for selected size and variant

The screenshot shows the Booking.com component viewer interface. The left sidebar has a 'Customer' dropdown and navigation links: Getting started, Design Principles, Best practices, Voice and tone, Accessibility, Brand, Product, Foundations, Components, Accordion, Alert (which is selected), Avatar, Avatar block, Badge, Banner, Breadcrumb, Bubble, Button, Card, and Carousel. The main content area has tabs for 'HTML' and '6.0.2'. The 'Alert' tab is active, displaying the following information:

Alert

Alerts are system messages that reflect system driven information to the users. Alerts do not communicate changes in content or features. Since they communicate important information, they are not dismissable by the user. They are not notifications or banners.

Success default

Confirms the completion of an action initiated by the user. This size is meant for short, single-line messages. An optional link can be displayed in context of the message for associated actions.

Variant: Success (radio button selected), Error, Warning

Sizes: Default (radio button selected), Large, Inline

States: Not applicable

Dependencies: button, link

A code snippet for the 'Success default' variant is shown:

```
1 <div class="bui-alert bui-alert--success bui-u-bleed#smallest" role="status">
2   <span class="icon-hint bui-alert__icon" role="presentation">
3     <IMG_HELPER icon name="iconset/checkmark_selected" class="" role="presentation">
4   </span>
5   <div class="bui-alert__description">
6     <p class="bui-alert__text">
7       <strong class="bui-f-font-strong">Your booking is confirmed.</strong> We've sent your confirmation
8     </p>
9   </div>
```

A 'Copy' button is located next to the code snippet.

Accessibility

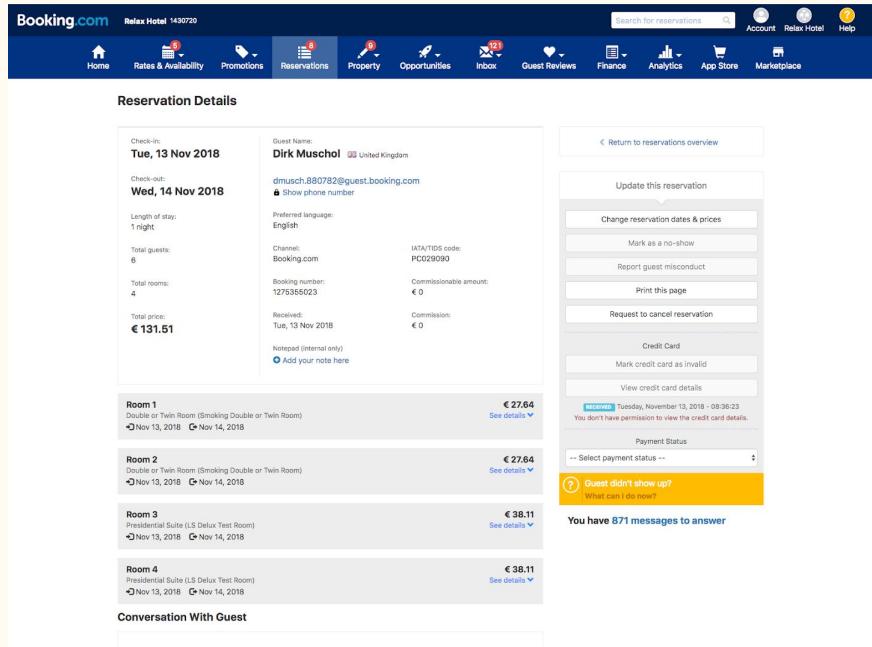
Each icon should have role="presentation" as an attribute.

Migrating reservation details page to the design system

The context

After designing and building the Booking products without any guidelines for over 15 years, we created and released in early 2017 the first version of the design system. Then began the work of migrating all products to the design system, which involved a mix of automation and refactoring.

The *reservation details* page is an area where partners (hoteliers or other property owners) can see the details of a specific reservation and perform various management, payment and communication actions.
[See large view of original version](#)



The screenshot shows the 'Reservation Details' page on the Booking.com interface. At the top, it displays the check-in date as 'Tue, 13 Nov 2018' and the check-out date as 'Wed, 14 Nov 2018'. Below this, it shows the guest information: 'Guest Name: Dirk Muschol (United Kingdom)', 'Email: dmusch.880782@guest.booking.com', and 'Phone number: Show phone number'. It also indicates the preferred language as 'English'. On the right side of the main content area, there are several buttons for managing the reservation, such as 'Change reservation dates & prices', 'Mark as a no-show', 'Report guest misconduct', 'Print this page', 'Request to cancel reservation', 'Credit Card', 'Mark credit card as invalid', 'View credit card details', and 'Payment Status'. A note at the bottom left of this sidebar says 'REMOVED Tuesday, November 13, 2018 - 08:36:23 You don't have permission to view the credit card details.' In the bottom right corner of the sidebar, there is a yellow box with a question mark icon and the text 'Guest didn't show up? What can I do next?' Below the main content area, there is a section titled 'Conversation With Guest' which is currently empty.

The problem

The previous variant of the page suffered from a fragmentation of experience and interaction, primarily due to individual teams working in isolation on horizontal features, without a holistic approach to the entire product. Migrating the entire page presented the opportunity to create a unified experience for the Booking.com partners that use this page daily.

One key challenge was minimizing disruption for partners with a significant overhaul of the page design..

Another key challenge was that we were bundling in one release the technical changes of migrating from the previous Mason/HTMLTemplate template framework (legacy Perl-based) to VueJS together with the various improvements we were making to the experience..

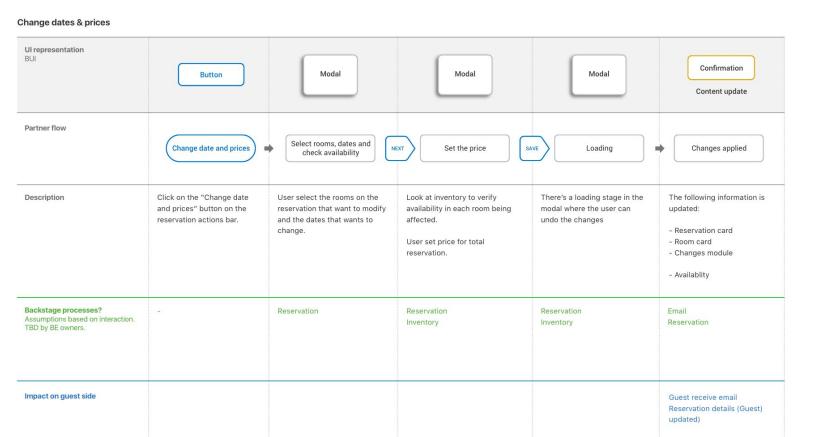
The process

1. Analysis & Audit

The initial step was mapping the existing features and their flow within and outside this page, to better understand entry points and interaction.

2. Research

The next step was looking at the overall page hierarchy and, based on previous partner research (surveys and interviews), together with Google Analytics data, determine which were the critical areas and features for the users.



Update this reservation

Change reservation dates & prices

Mark as a no-show

Report guest misconduct

Print this page

Request to cancel reservation

Credit Card

Mark credit card as invalid

View credit card details

Payment Status

Change reservation dates & prices

Applicable rooms:

Deluxe Triple Room

Check in date: 2018-09-26 Check out date: 2018-09-27

Check availability & change price

Cancel

Guest didn't show up? What can I do now?

You have 526 messages to answer

Update this reservation

Change reservation dates & prices

The room availability has changed and we can proceed to change the dates of this reservation.

1778501026

26 Sep - September 2018 - 27 September 2018

€ Price

Adjust the total price for this reservation. The total amount will be equally distributed among the rooms.

Commission: € 4.80

€ 130

If you'd like to adjust the price per room, please select under which room under the applicable rooms section in the previous step.

Cancel

Guest didn't show up? What can I do now?

You have 526 messages to answer

Update this reservation

A change has been made to this reservation. The last update was on Sep 26, 2018 at 5:59 PM.

26 Sep - September 2018 - 27 September 2018

€ Price

26 Sep - September 2018 - 27 September 2018

€ Price

Please note: After a reservation's dates have been changed, availability will automatically be updated in your calendar.

Overview

Check-in: Fri, 26 Sep 2018

Check-out: Fri, 28 Sep 2018

Length of stay: 2 nights

Total guests: 2

Preferred language: English (US)

Change

WOTD costs

Guest Name: Andr Ur - Netherlands

E-mail: andr.7742@quest.booking.com

Phone: +31 6 31984121 Some address City

Comments

Old and new version

Reservation Details

Check-in: Tue, 13 Nov 2018
Check-out: Wed, 14 Nov 2018

Length of stay: 1 night
Total guests: 8
Total rooms: 4
Total price: € 131.51

Guest Name: Dirk Muschol (United Kingdom)
dmsuch.880782@guest.booking.com
Show phone number

Preferred language: English
Channel: Booking.com IATA/TIDS code: PC028900
Booking number: 1275355023 Commissionable amount: € 0

Received: Tue, 13 Nov 2018 Commission: € 0
Notepad (internal only) Add your note here

Room 1
Double or Twin Room (Smoking Double or Twin Room)
Nov 13, 2018 - Nov 14, 2018
€ 27.64 See details ▾

Room 2
Double or Twin Room (Smoking Double or Twin Room)
Nov 13, 2018 - Nov 14, 2018
€ 27.64 See details ▾

Room 3
Presidential Suite (LS Delux Test Room)
Nov 13, 2018 - Nov 14, 2018
€ 38.11 See details ▾

Room 4
Presidential Suite (LS Delux Test Room)
Nov 13, 2018 - Nov 14, 2018
€ 38.11 See details ▾

Conversation With Guest

Today, 08:36:39
Hello And thank you for booking at Relax Hotel!
The Check-in open at 18:30 and closes at 20:00
The Check-out starts from 07:00, to

Reservation details

Arrival: Tue, 16 Apr 2019
Departure: Thu, 18 Apr 2019

Total guests: 2 adults
Total rooms: 1
Total Price: \$ 325

Guest details: Andrew Michael Fowles (United Kingdom)
Japan
thiom.759451@guest.booking.com
+81 3 6685 0069
05-8333 Tokyo Prefecture, Minato-ku, Japan

Preferred language: English
Channel: booking.com IATA/TIDS code: PC028900
Booking reference number: 1682058016 Commissionable amount: \$ 300

Received: Wed, 28 Nov 2018 Commission: \$ 30
Notepad (internal only) Add your note here

Credit card and payment

Payment status: -- Select payment status --
Guest didn't show up? What can I do now?

Important information about this guest
You have a Booker that would prefer a quiet room. (based on availability).

Approximate arrival time
Between 11:00 AM and 12:00 PM

Deluxe Triple Room
Apr 16, 2019 - Apr 18, 2019
\$ 325

Conversation with guest

No new messages. Send a new message

Hello and thank you for booking at our property!
The check-in opens at 16:00 and closes

Various contexts for the page

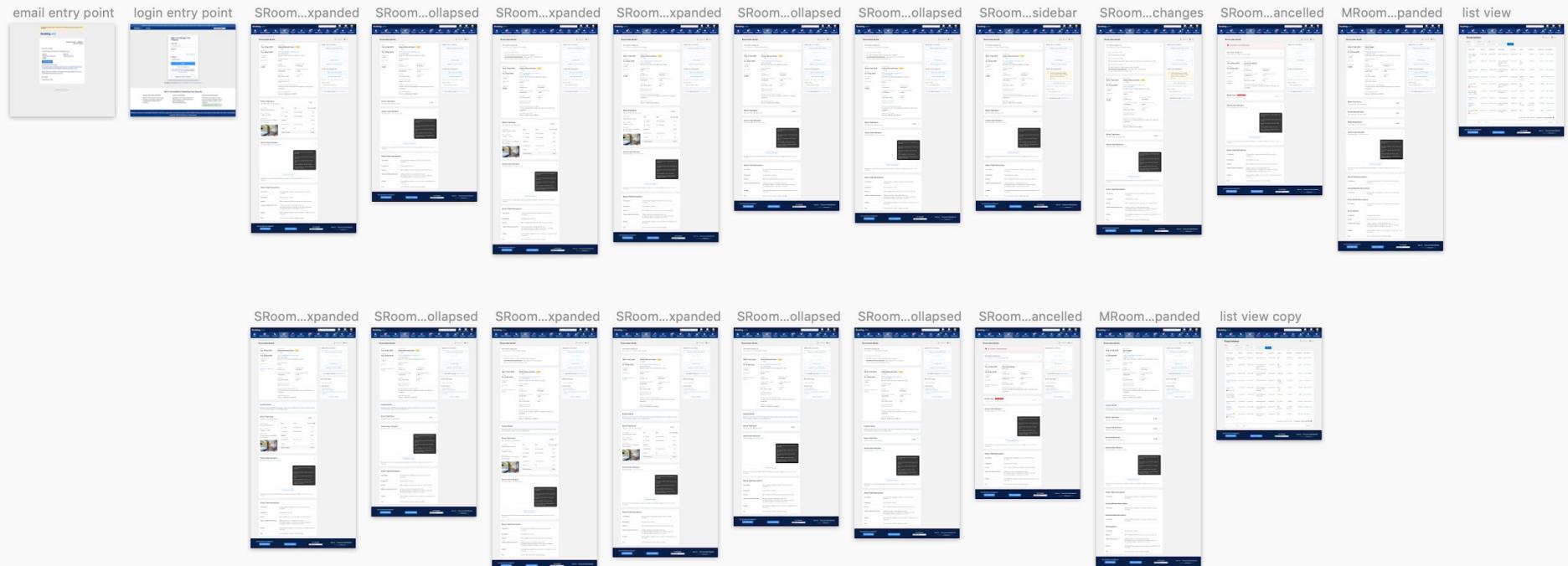
This screenshot shows the 'Reservation details' page for a double room cancellation. The guest has canceled their stay on March 28, 2019. The page includes sections for 'Reservation details', 'Credit card and payment', and 'Conversation with guest'. It also features a sidebar with room policy information and a footer with language and privacy links.

This screenshot shows the 'Reservation details' page for a double room update. The guest has changed their arrival date to February 27, 2019. The page includes sections for 'Reservation details', 'Credit card and payment', and 'Conversation with guest'. It also features a sidebar with room policy information and a footer with language and privacy links.

This screenshot shows the 'Reservation details' page for a triple room cancellation. The guest has canceled their stay on April 19, 2019. The page includes sections for 'Reservation details', 'Credit card and payment', and 'Conversation with guest'. It also features a sidebar with room policy information and a footer with language and privacy links.

This screenshot shows the 'Reservation details' page for a triple room update. The guest has changed their arrival date to April 19, 2019. The page includes sections for 'Reservation details', 'Credit card and payment', and 'Conversation with guest'. It also features a sidebar with room policy information and a footer with language and privacy links.

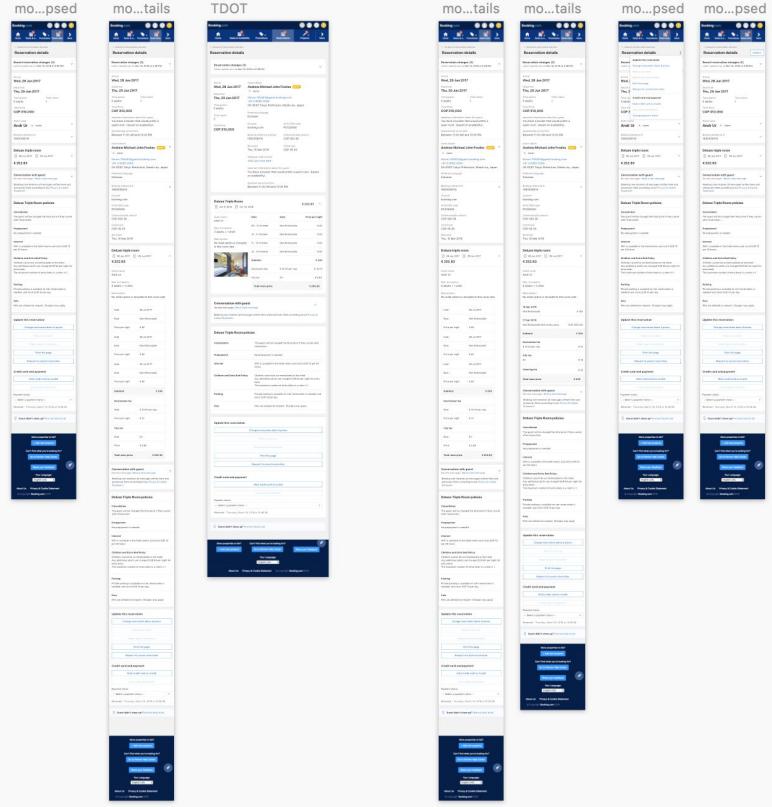
Variations based on context and partner type



The process

3. Design, critique, iterations

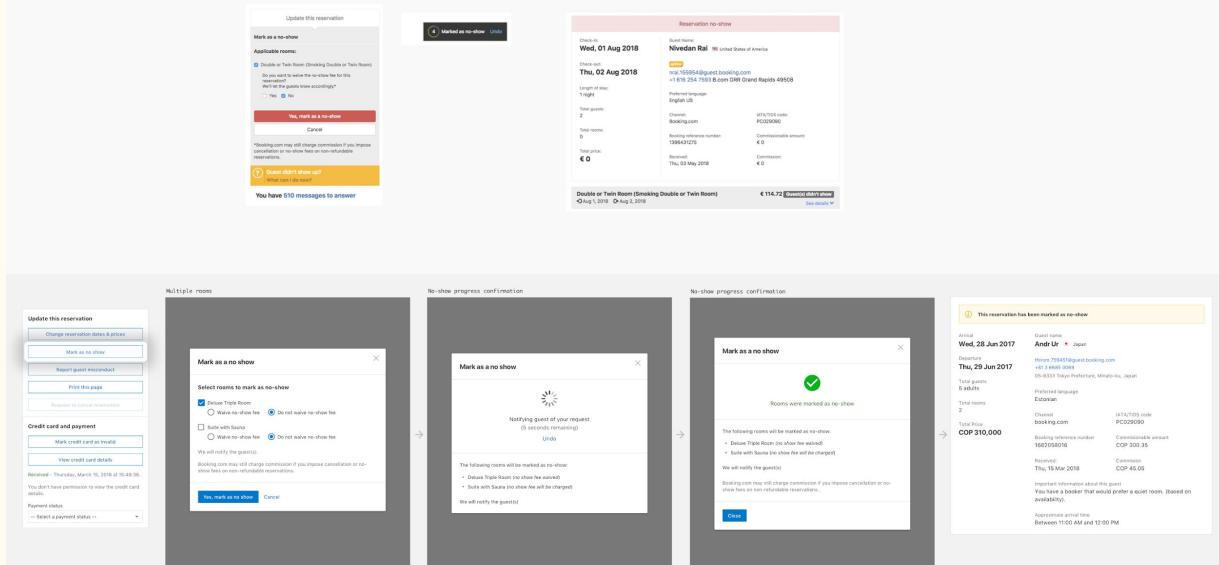
Afterwards, I designed an initial draft for the key states of the page (primarily driven by reservation status - active, cancelled, pending cancellation) and setup several rounds of design critique with designers working on individual features on this page. Additionally, I created the detailed responsive view for the variety of contexts that depended on various conditions to illustrate scaling and application of components to all features and areas.



The process

Design, critique, iterations

One of the significant changes was to move interaction context for sidebar actions to modal windows instead of the sidebar space, to create better focus on the action performed and the outcome confirmation.



The outcome

After design critique and more iterations, together with another designer and a researcher, I organized a partner research session with 10 property owners with various profiles (from small property owners, to hotel managers) as well as different locations (India, Nigeria, Bhutan, Serbia, UK, Ireland and New Zealand) to get feedback from them on the design and interaction changes we were making.

We used an invision prototype to simulate a complete flow starting with an email entry point and guiding the partners through the key actions they typically perform on this page. The response was universally positive regarding the design and interaction changes, navigation and overall information architecture.

Following positive feedback from the partner research, my team started implementing the page and will be schedule for experimentation and release in Q2-Q3 2019.

Iconography at Booking.com

The context

In 2016, the state of iconography at Booking was rather messy, due to lack of a consistent approach to both design and implementation of icons. We had some 2000 symbols still rendered as individual raster icons (png/gif/jpeg), some 500 symbols in an iconfont, some icons rendered as SVG and some created with CSS. There were no rules regarding the design and creation of new icons.

There was no clear system in place to add new icons to ensure consistency across platforms, due to entirely separated systems used for the customer-facing products, partner-facing products and mobile apps.

The problem

Some of the key challenges included:

- choosing a scalable and flexible technical solution for icon delivery
- removing symbol duplication
- ensuring clear authoring and consistency in icon design
- designing and implementing a deployment system that allowed synchronizing icon sets across multiple platforms

The process

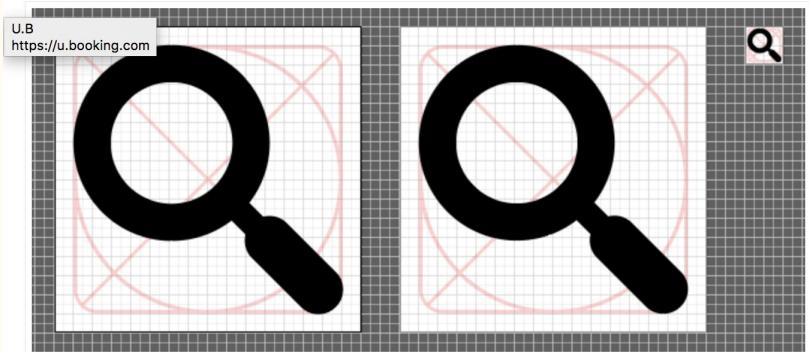
1. Research & Roadmapping
2. Create guidelines for iconography design
3. Consolidate the iconset project
4. Refactor and deprecate .png sprite
5. Refactor and deprecate iconfont iconography
6. Automate (some) deployment
7. Prepare the testing ground for entire iconsets

The process - highlight

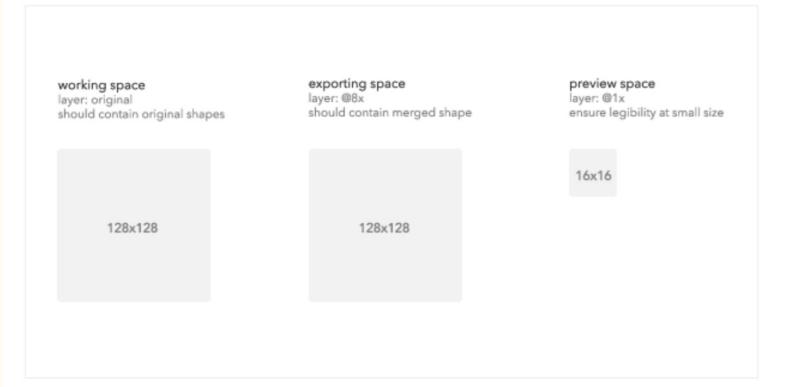
Create guidelines for iconography design

One of the key steps in establishing better quality iconography at Booking was creating guidelines for icon design. Along with Andrei Herasimchuk, I created the assets and guidelines for iconography which were then employed to create all new icons and improved the existing ones.

The guidelines provide information regarding: sizing, scaling guides, style, line/stroke weight, anchor point positioning, technical instructions for export and deployment.



After you open the file you will see three areas:



The process - highlight

Consolidate the iconset project

One of the key steps in improving iconography was to reduce repetition of similar symbols (8 different variations of checkmarks to 1) and redraw various icons which were poorly done.

I lead a project which involved 30+ designers, and over 3 weeks, we redrew ~300 symbols (about 150 myself, and the rest distributed across the rest of the project team). In addition to creating better iconography, everyone involved in the project also provided keywords for each icon, which allowed us to build tooling which provided a search feature, making it easier to find icons. The keyword mapping also allows future transition to any other icon set by linking similar or identical icons based on keyword.

At the end of the project, we proceeded to replace the previous 2000+ icons with the consolidated set of symbols.

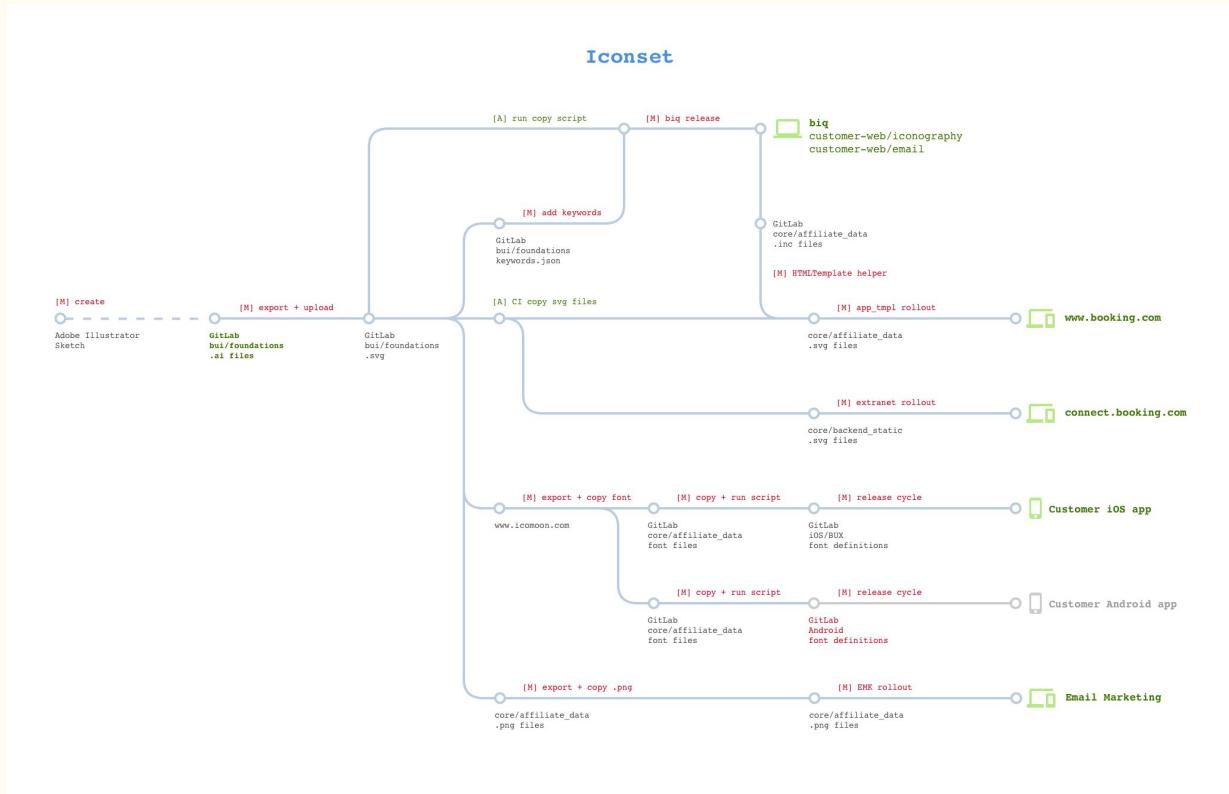
Arrow icons before and after consolidation



Iconography roadmap - large view



Iconography deployment process - large view



The outcome

- Created roadmap for iconography at Booking
- Created guidelines used for iconography design by 200+ designers
- Defined icon deployment system and vision
- Deprecated legacy icon rendering methods (png and iconfont systems)
- Consolidated the set of icons in use on Booking
- Documented, trained and supported designers in designing and deploying new iconography
- Unwillingly was “the icon guy” for about 2 years