Webapp project management and development

Context — Following the great success of the previous website I designed for this agency, I was asked to lead the strategy, planning, and execution of their next one. My project management and development experience had grown significantly, so my contract also included being the primary developer for this project.

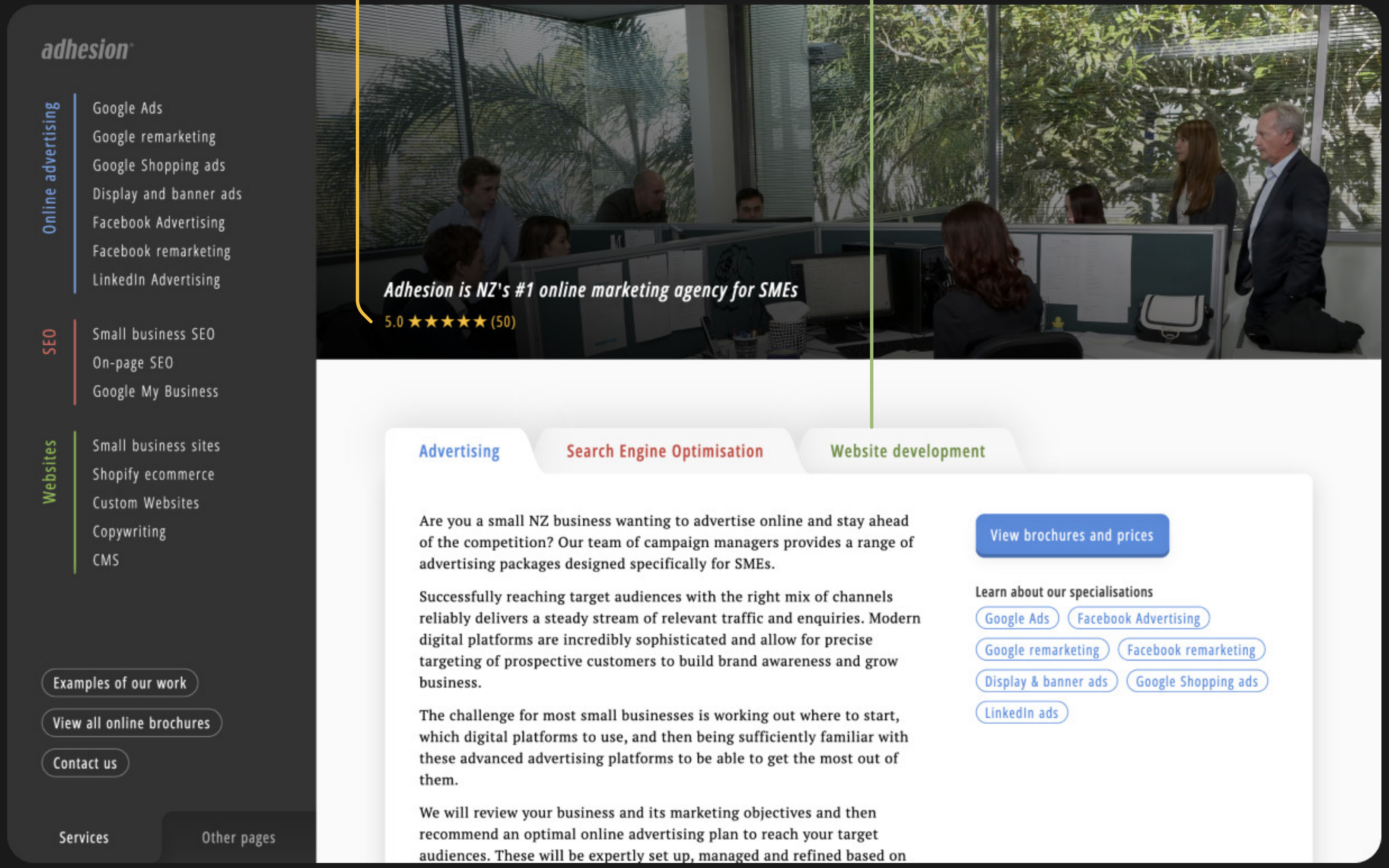
Objectives — The new site was to be a much more functional webapp, to tackle a number of business goals:

- Functional alignment/integration between this new site and other digital tools used by the agency (e.g. to ensure up-to-date and consistent pricing data across multiple properties/tools).
- Improved usability and customer experience, specifically to position their brand higher in their market (e.g. ensure they could continue to be a leader for the services they provide).
- Provide a more personalised experience to users by building a more functional UI (e.g. give users more control of what they see, and provide deeper info that is relevant to their circumstances).
- Integrate a custom CMS with no frills to enable excellent content creation (e.g. make it easy to build and customise sections of content using a variety of integrated components).

Constraints — The new site was to be designed in close collaboration with the agency. I was responsible for ensuring the new site was a pixel-perfect match with any designs we agreed on.

Up-to-date data pulled via API

Interactive content enables personalisation



Adhesion is NZ's #1 online marketing agency for SMEs

5.0 ★★★★★ (50)

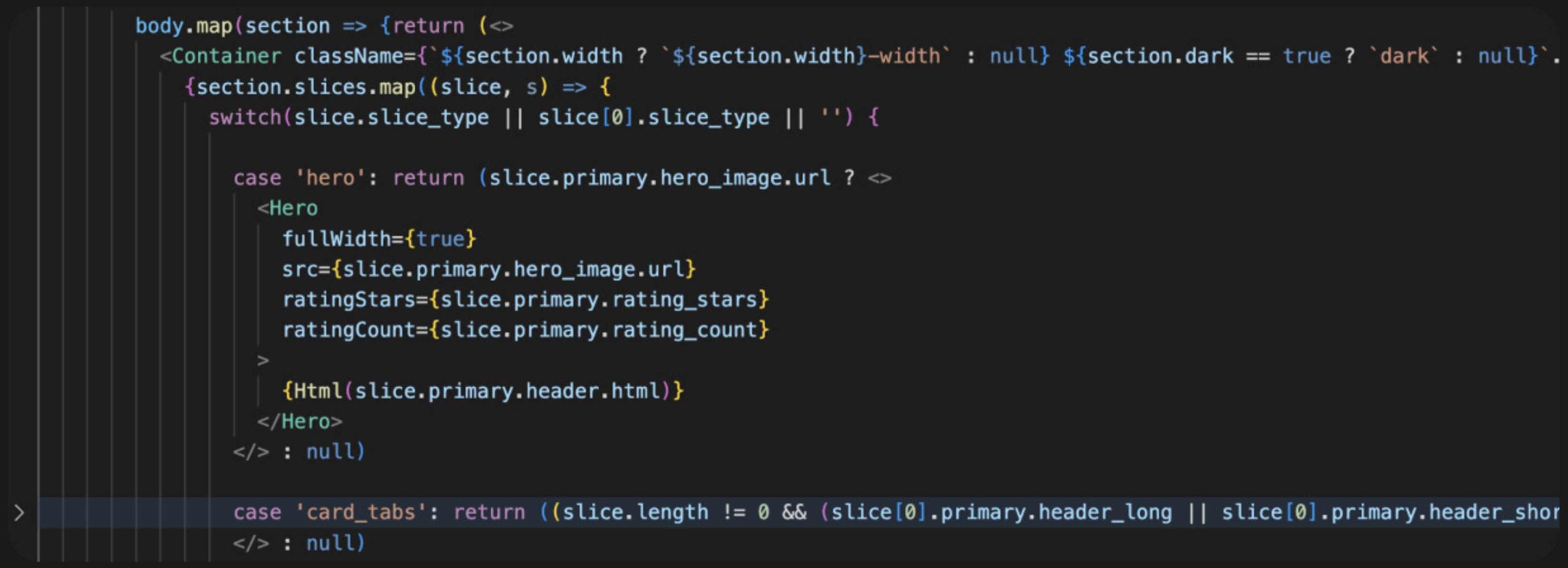
Are you a small NZ business wanting to advertise online and stay ahead of the competition? Our team of campaign managers provides a range of advertising packages designed specifically for SMEs.

Successfully reaching target audiences with the right mix of channels reliably delivers a steady stream of relevant traffic and enquiries. Modern digital platforms are incredibly sophisticated and allow for precise targeting of prospective customers to build brand awareness and grow business.

The challenge for most small businesses is working out where to start, which digital platforms to use, and then being sufficiently familiar with these advanced advertising platforms to be able to get the most out of them.

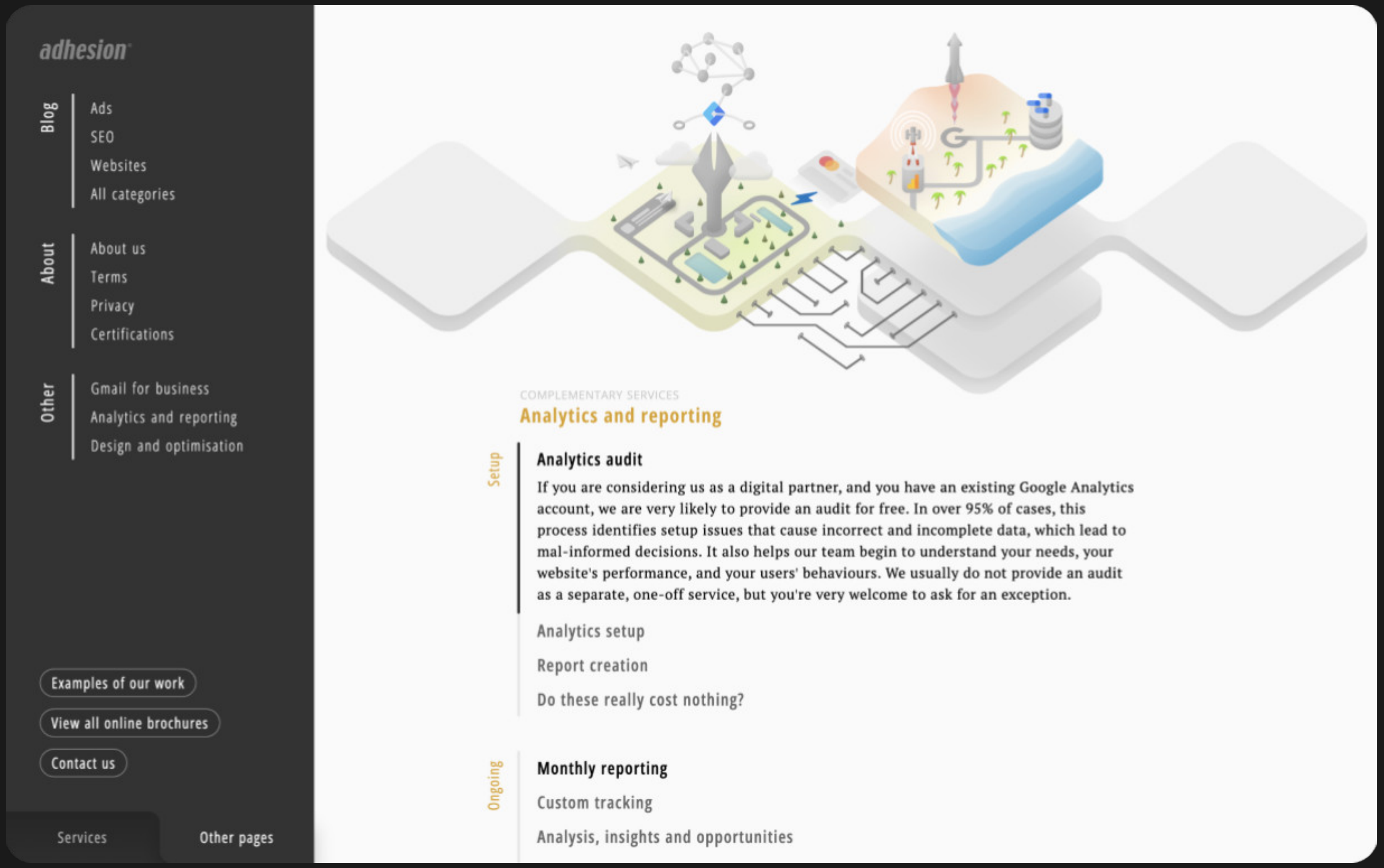
We will review your business and its marketing objectives and then recommend an optimal online advertising plan to reach your target audiences. These will be expertly set up, managed and refined based on

Everything built as responsive components for flexible use with various content



```
body.map(section => {return (<>
  <Container className={`${section.width ? `${section.width}-width` : null} ${section.dark == true ? `dark` : null}`.
    {section.slices.map((slice, s) => {
      switch(slice.slice_type || slice[0].slice_type || '') {

        case 'hero': return (slice.primary.hero_image.url ? <>
          <Hero
            fullWidth={true}
            src={slice.primary.hero_image.url}
            ratingStars={slice.primary.rating_stars}
            ratingCount={slice.primary.rating_count}
          >
            {Html(slice.primary.header.html)}
          </Hero>
        </> : null)

        case 'card_tabs': return ((slice.length != 0 && (slice[0].primary.header_long || slice[0].primary.header_shor
        </> : null)
```

All pages built from a library of components, customisable via CMS


Semi-3D animated SVG reflects quality of brand and services

adhesion

Blog
- Ads
- SEO
- Websites
- All categories

About
- About us
- Terms
- Privacy
- Certifications

Other
- Gmail for business
- Analytics and reporting
- Design and optimisation

COMPLEMENTARY SERVICES

Analytics and reporting

Setup

Analytics audit

If you are considering us as a digital partner, and you have an existing Google Analytics account, we are very likely to provide an audit for free. In over 95% of cases, this process identifies setup issues that cause incorrect and incomplete data, which lead to mal-informed decisions. It also helps our team begin to understand your needs, your website's performance, and your users' behaviours. We usually do not provide an audit as a separate, one-off service, but you're very welcome to ask for an exception.

Analytics setup

Report creation

Do these really cost nothing?

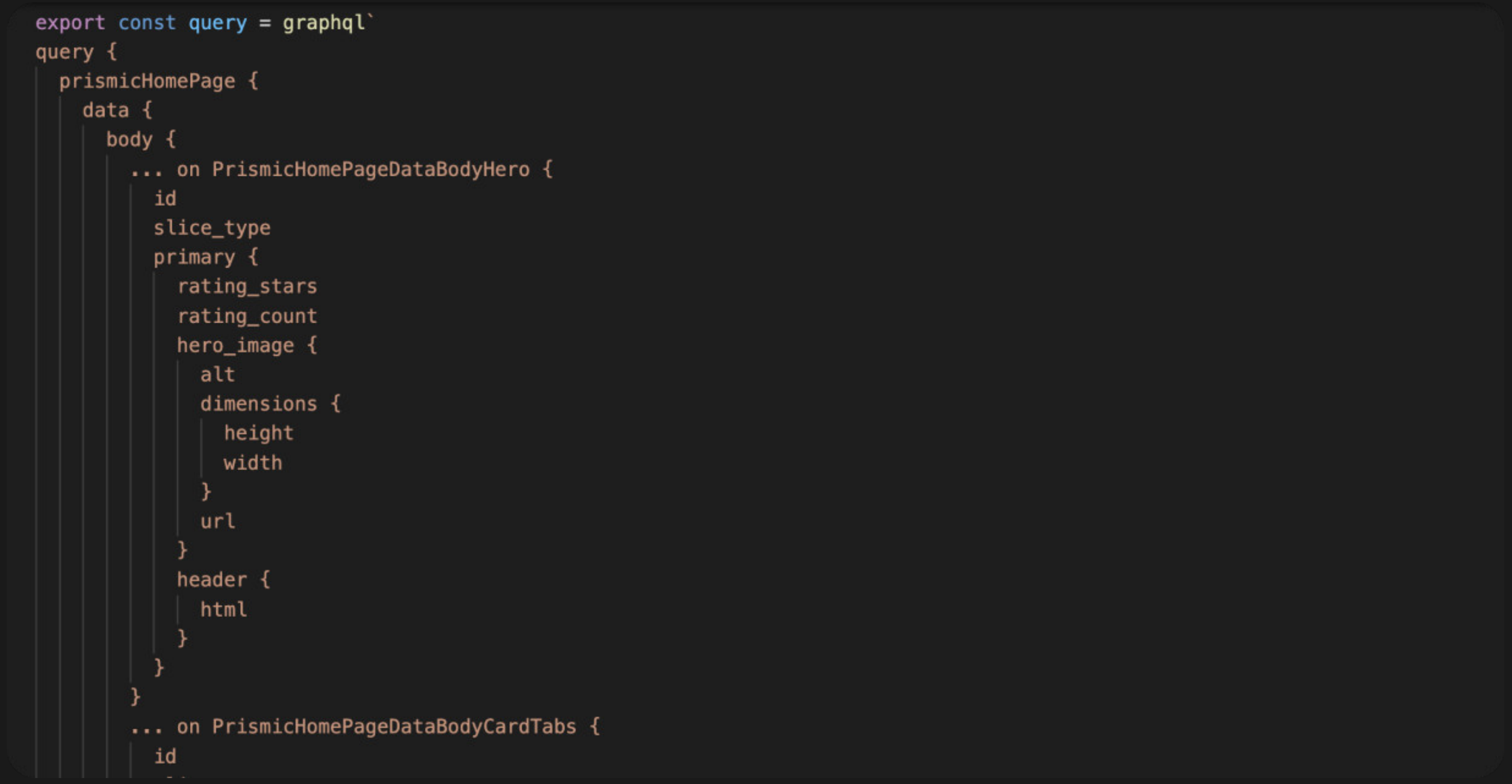
Ongoing

Monthly reporting

Custom tracking

Analysis, insights and opportunities

Highly configurable FAQ-style dropdowns with additional analytics



```
export const query = graphql`
query {
  prismicHomePage {
    data {
      body {
        ... on PrismicHomePageDataBodyHero {
          id
          slice_type
          primary {
            rating_stars
            rating_count
            hero_image {
              alt
              dimensions {
                height
                width
              }
              url
            }
            header {
              html
            }
          }
        }
        ... on PrismicHomePageDataBodyCardTabs {
          id
```

Most components can facilitate almost all types of customisable content, incorporated via Prismic/GraphQL

Strategy — We knew to use a very modern tech-stack to enable an extreme level of performance for both users and SEO. From there, we discussed how we could incorporate the business' other strategies for brand position, pricing, content, marketing and growth. Most design decisions you see illustrated here (and how they differ from the original website) reflect and empower these strategies (more on this later).

Planning — The scope, timeline, budget and resources for this new webapp was based around a number of other business initiatives, including a revamp of their CRM and the launch of several automations to improve their team's efficiency. Although I was the primary developer, we planned a few key aspects to be done in-step with their senior developer, so the order and timing was discussed thoroughly.

Research — Back when I delivered their previous website, we knew there was a good chance that I would also be involved with a future project (i.e. this new webapp). So, I had proactively set up a lot of custom tracking (e.g. via GA, GTM, etc) that I knew would be useful for key design differences (e.g. deciding to go with a more comprehensive side-bar navigation).

Training — As part of this project, I trained most of the staff about the design direction for this webapp, and the principals used to make design decisions. This is important to uphold consistency (after my contract had finished) and to ensure they would be able to effectively customise future pages via the CMS (e.g. publishing articles). I also provided technical training to an employee who was responsible for executing their content strategy, to ensure they could fully leverage the CMS' functionality, and pass on my knowledge as needed over time.

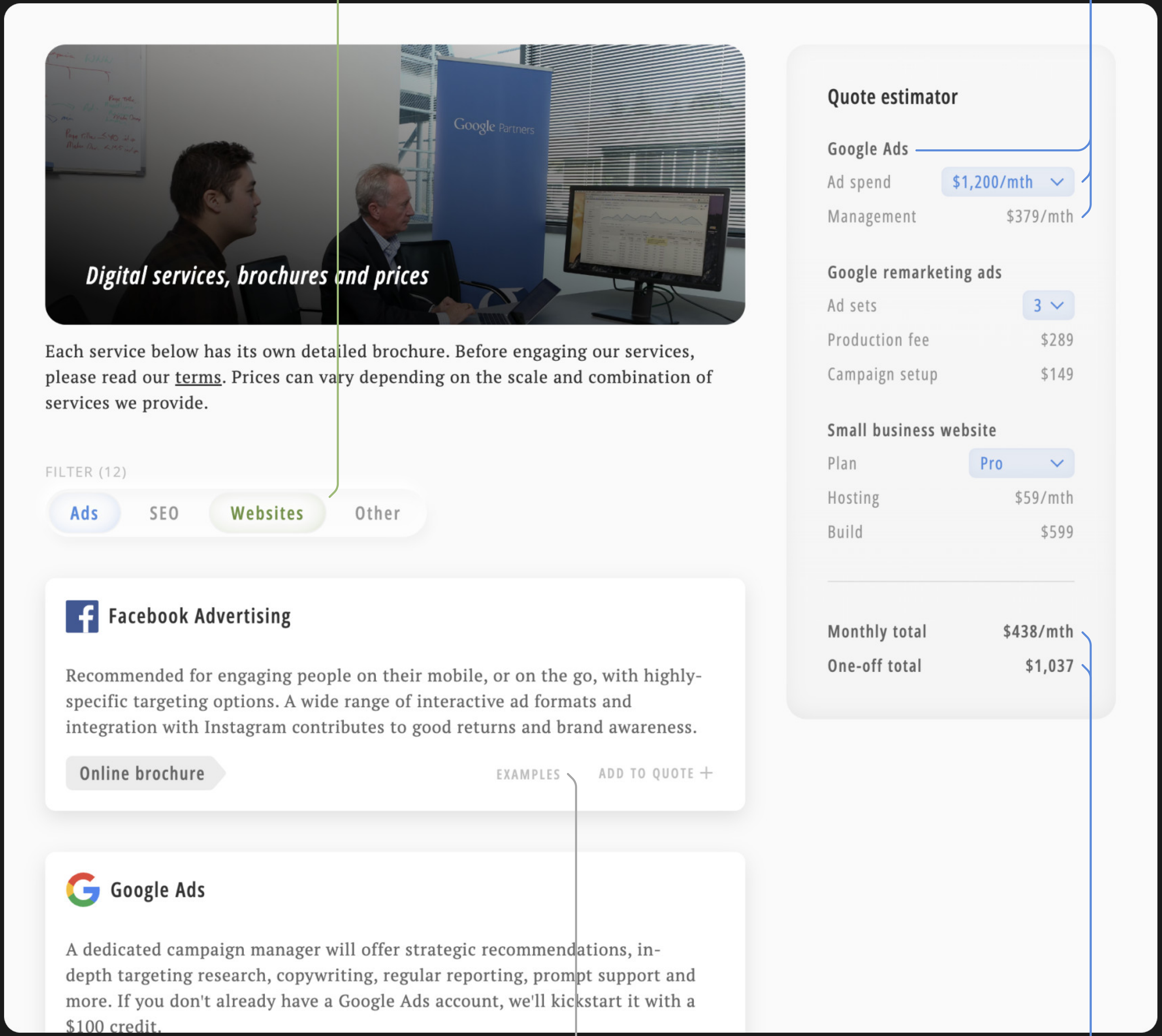
Parent services page — The original site had a main 'parent' page for each of the business' service categories (e.g. advertising). Their SEO performance was good, but they provided little UX value. We designed this template (right) to give users a better understanding of the business' various combinations of services. This template allows users to:

- Filter what they're interested in.
- Expand cards to view specific examples.
- Get an estimated quote for anything.
- Click through to a 'brochure' page for more detailed info about a service.

Quote estimator — I developed all the logic for this component, and integrated it with the Prismic CMS I built out for employees to use. This allows the business to easily add/delete/change any service with customisable card content and pricing. Staff can even configure multiple dropdowns differently for quoting more complex services (e.g. those with add-ons). The logic I developed to integrate the CMS and the webapp handles everything else automatically.

Filters pre-set based on user source/behaviour

Customisable dropdowns and pricing options, with tracking to enable price-optimisation



Digital services, brochures and prices

Each service below has its own detailed brochure. Before engaging our services, please read our terms. Prices can vary depending on the scale and combination of services we provide.

FILTER (12)

Facebook Advertising

Recommended for engaging people on their mobile, or on the go, with highly-specific targeting options. A wide range of interactive ad formats and integration with Instagram contributes to good returns and brand awareness.

Google Ads

A dedicated campaign manager will offer strategic recommendations, in-depth targeting research, copywriting, regular reporting, prompt support and more. If you don't already have a Google Ads account, we'll kickstart it with a $100 credit.

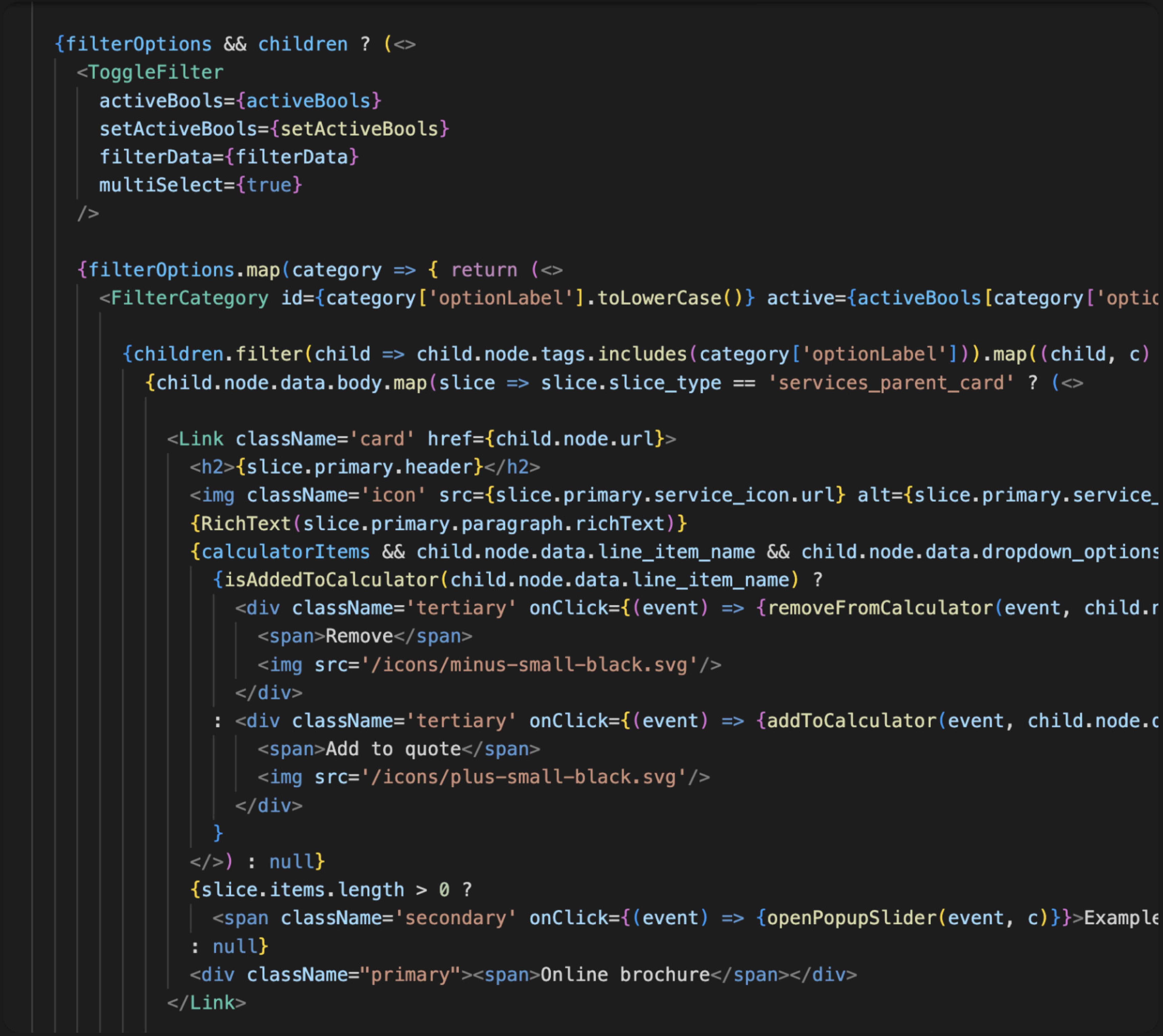
Quote estimator

Google Ads	
Ad spend	$1,200/mth
Management	$379/mth
Google remarketing ads	
Ad sets	3
Production fee	$289
Campaign setup	$149
Small business website	
Plan	Pro
Hosting	$59/mth
Build	$599
Monthly total	**$438/mth**
One-off total	**$1,037**

Presents scrollable series of examples, customisable via CMS

Recommendations and CTAs can be configured based on outputs

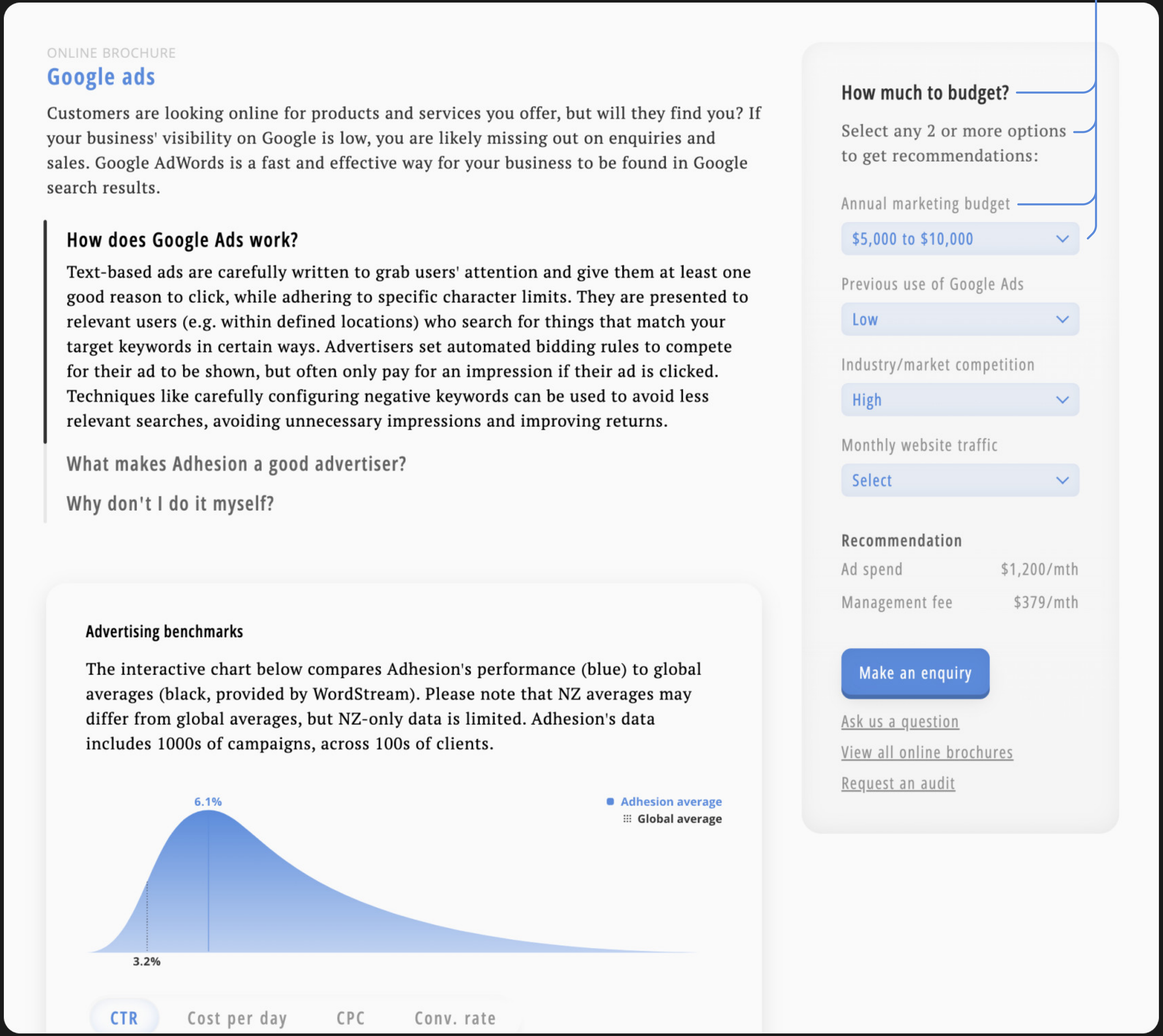
React — This slide is simply to showcase some of the code behind the components in the previous slide. If you're not familiar with code like this, feel free to skip this part.



```
{filterOptions && children ? (<>
  <ToggleFilter
    activeBools={activeBools}
    setActiveBools={setActiveBools}
    filterData={filterData}
    multiSelect={true}
  />

  {filterOptions.map(category => { return (<>
    <FilterCategory id={category['optionLabel'].toLowerCase()} active={activeBools[category['optic

      {children.filter(child => child.node.tags.includes(category['optionLabel'])).map((child, c)
        {child.node.data.body.map(slice => slice.slice_type == 'services_parent_card' ? (<>

          <Link className='card' href={child.node.url}>
            <h2>{slice.primary.header}</h2>
            <img className='icon' src={slice.primary.service_icon.url} alt={slice.primary.service_
            {RichText(slice.primary.paragraph.richText)}
            {calculatorItems && child.node.data.line_item_name && child.node.data.dropdown_options
              {isAddedToCalculator(child.node.data.line_item_name) ?
                <div className='tertiary' onClick={(event) => {removeFromCalculator(event, child.r
                  <span>Remove</span>
                  <img src='/icons/minus-small-black.svg'/>
                </div>
              : <div className='tertiary' onClick={(event) => {addToCalculator(event, child.node.c
                  <span>Add to quote</span>
                  <img src='/icons/plus-small-black.svg'/>
                </div>
              }
            </>) : null}
            {slice.items.length > 0 ?
              <span className='secondary' onClick={(event) => {openPopupSlider(event, c)}}>Example
            : null}
            <div className="primary"><span>Online brochure</span></div>
          </Link>
```

Technical stuff — When employees publish a content update via the Prismic CMS, a webhook triggers a deployment via Netlify. The information from the CMS is saved in the public page-data directory. This data informs Netlify how to structure the build, incorporating the data into the templates and other files pulled from the GitHub repo. A GraphQL query in each template/page pulls in the Prismic page data, and the React logic incorporates it with the appropriate components.

Survey to provide contextual information, fully customisable via CMS



ONLINE BROCHURE

Google ads

Customers are looking online for products and services you offer, but will they find you? If your business' visibility on Google is low, you are likely missing out on enquiries and sales. Google AdWords is a fast and effective way for your business to be found in Google search results.

How does Google Ads work?

Text-based ads are carefully written to grab users' attention and give them at least one good reason to click, while adhering to specific character limits. They are presented to relevant users (e.g. within defined locations) who search for things that match your target keywords in certain ways. Advertisers set automated bidding rules to compete for their ad to be shown, but often only pay for an impression if their ad is clicked. Techniques like carefully configuring negative keywords can be used to avoid less relevant searches, avoiding unnecessary impressions and improving returns.

What makes Adhesion a good advertiser?

Why don't I do it myself?

Advertising benchmarks

The interactive chart below compares Adhesion's performance (blue) to global averages (black, provided by WordStream). Please note that NZ averages may differ from global averages, but NZ-only data is limited. Adhesion's data includes 1000s of campaigns, across 100s of clients.

How much to budget?

Select any 2 or more options to get recommendations:

Annual marketing budget	$5,000 to $10,000
Previous use of Google Ads	Low
Industry/market competition	High
Monthly website traffic	Select

Recommendation

Ad spend	$1,200/mth
Management fee	$379/mth

Ask us a question

View all online brochures

Request an audit

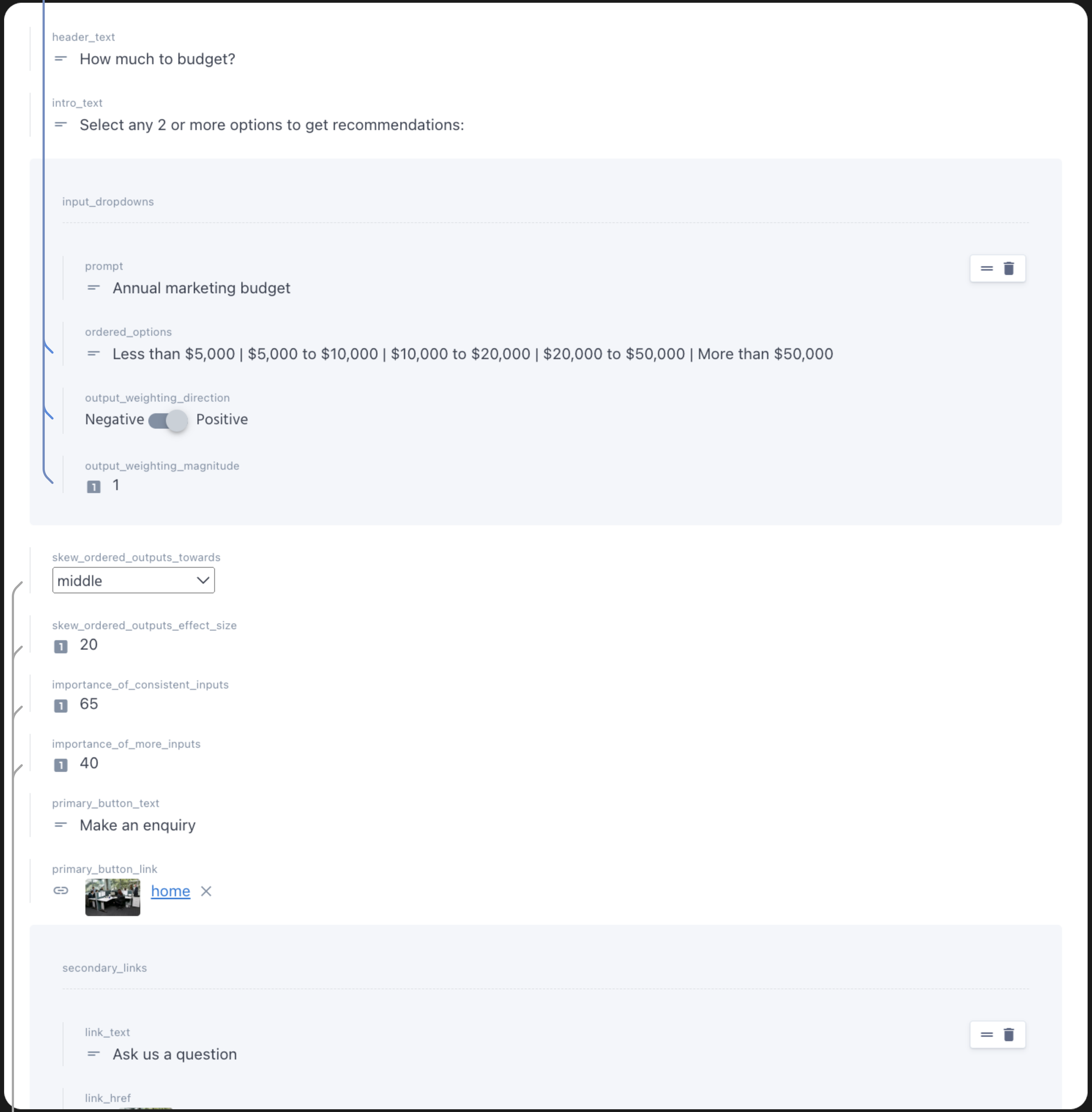
Provides contextual answers that users value, while automating the collection of rich data to support lead generation and market research

Child service page — The original site had a 'child' page for each of the business' services (e.g. Google Ads). They each had a link to a downloadable brochure (this introduced an extra step to static info that easily became out-of-date/inconsistent with the original website). In-step with shifting focus from acquisition quantity to acquisition quality and retention (and to uphold the business' transparent policy), the decision was made to make all brochure content immediately accessible.

Widget — We worked with sales team to understand trends when converting enquiries into leads. Enquiries into many services often involved a common question (e.g. "*How much should we spend?*"). Giving a good answer required the sales person to first ask a few questions.

I made a simple component that would allow staff to set up a simple 'survey', but there was a problem. In this case, there are 4 dropdowns containing 19 options, resulting in 945 possible combinations of inputs that need to be mapped to 13 possible outputs (just for one survey). So, I engineered a scalable solution (next page).

Example of one dropdown with 5 ordered options and variables for its influence on the output



header_text
How much to budget?

intro_text
Select any 2 or more options to get recommendations:

input_dropdowns

prompt
Annual marketing budget

ordered_options
Less than $5,000 | $5,000 to $10,000 | $10,000 to $20,000 | $20,000 to $50,000 | More than $50,000

output_weighting_direction
Negative ● Positive

output_weighting_magnitude
1

skew_ordered_outputs_towards
middle

skew_ordered_outputs_effect_size
20

importance_of_consistent_inputs
65

importance_of_more_inputs
40

primary_button_text
Make an enquiry

primary_button_link
home

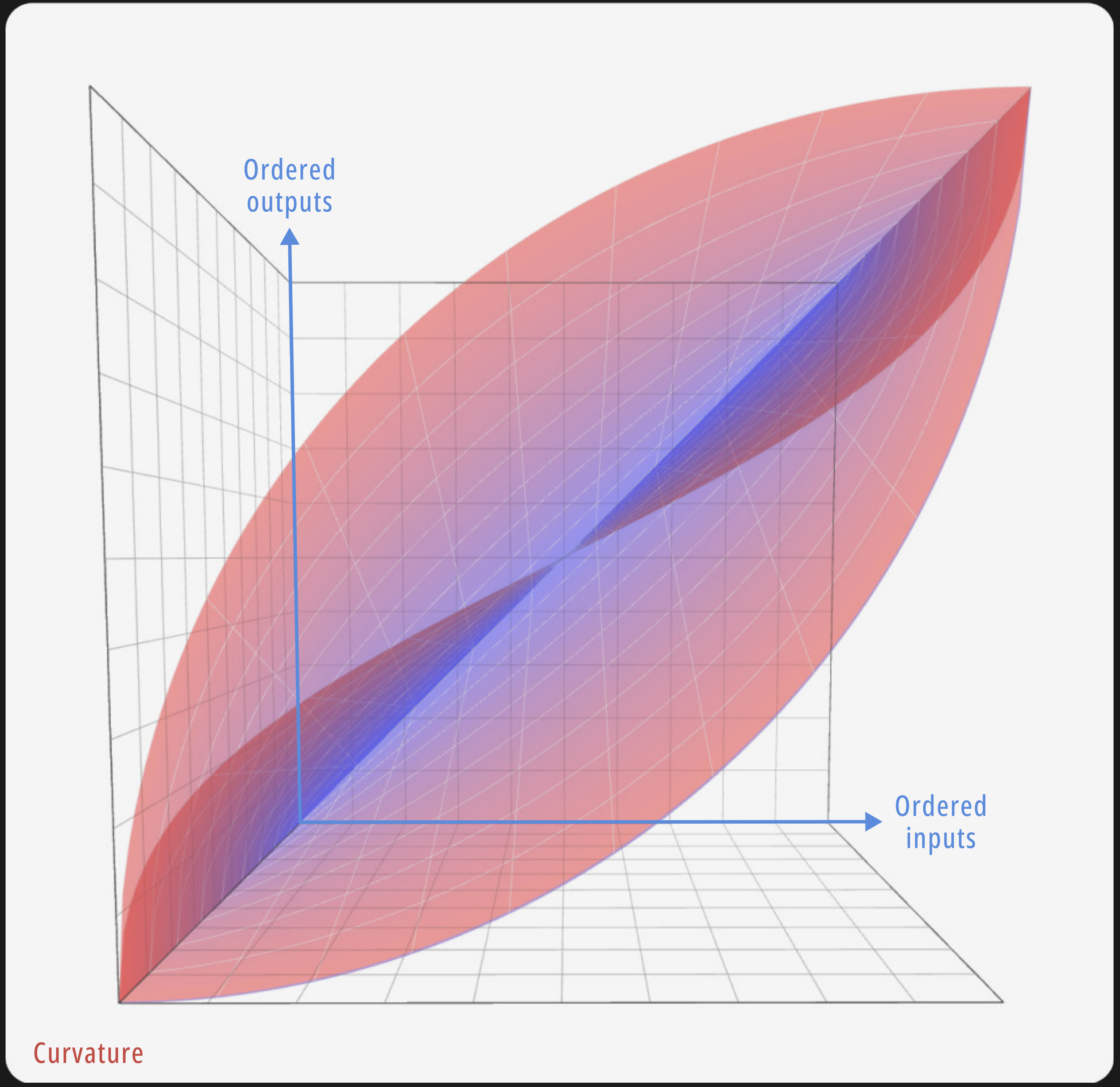
secondary_links

link_text
Ask us a question

link_href

Curvature variables for shifting the probability of getting certain outputs (the outputs are not visible in this screenshot)

Technical stuff — Many of the dropdown options (inputs) and recommendations (outputs) can be ordered along a scale (e.g. low to high), so we can automatically map any combination of inputs to any number of outputs (e.g. via normalization). Each input also has its own weight and bias (like nodes in a single-layer neural network) to adjust the magnitude and direction of its effect on the output. The output is also adjusted by one of three curvature functions, either slightly or a lot, to shift the probability of getting certain outputs (below).



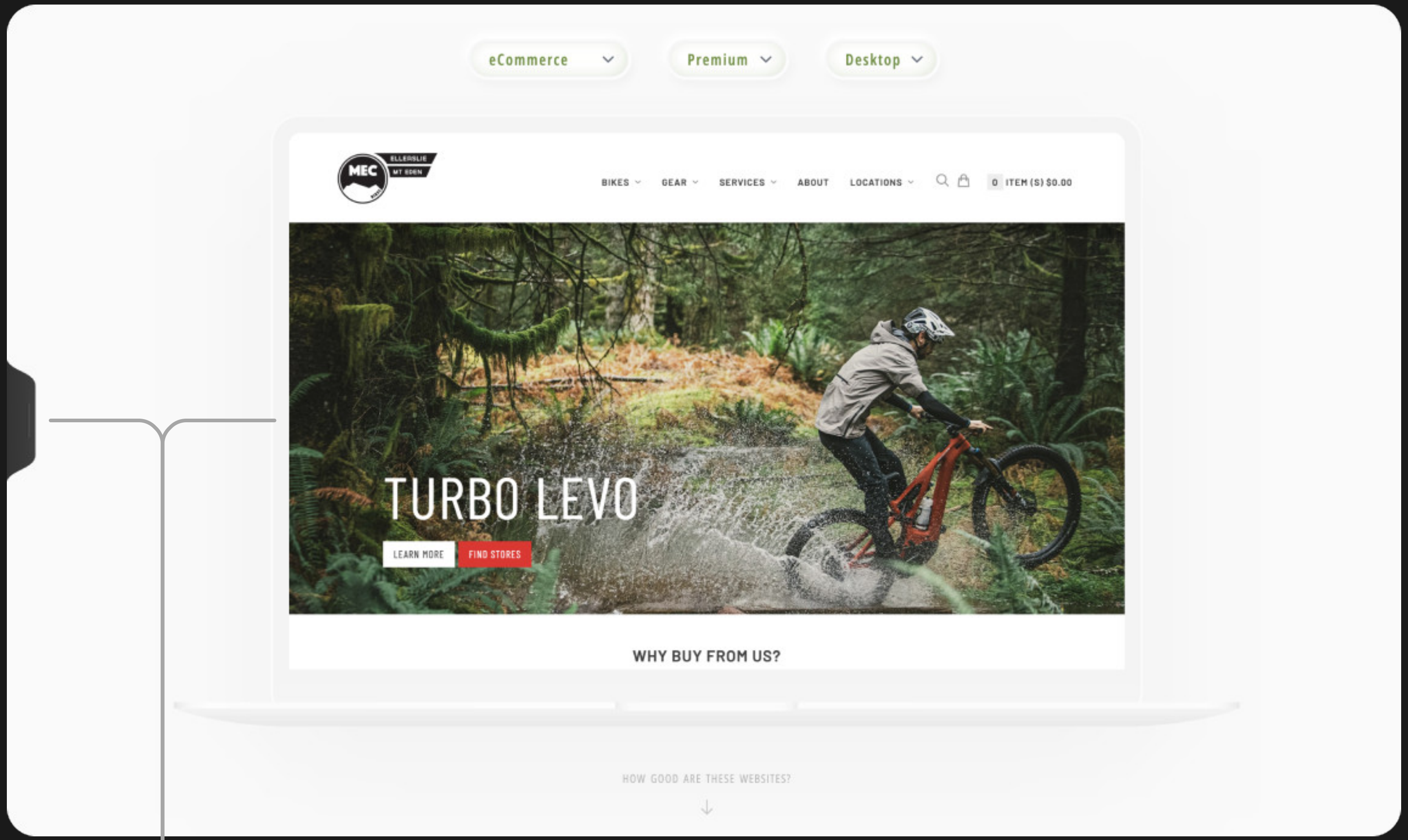
Special web packages — As part of the business' wider service strategy, we planned to emphasise the value of their website packages (bundled separately from their other dev services). The original site had a section dedicated to showcasing work from all service categories, but it became apparent that a unique template would be needed to showcase these website packages (top right).

There are around a dozen website examples that can be viewed (to reflect the customisability of the business' website packages) using the filter dropdowns. Users can switch between desktop and mobile views, and scroll through them as if they are embedded. There is also a variety of informative sections/components further down this page but, for brevity, I have not included them in this presentation.

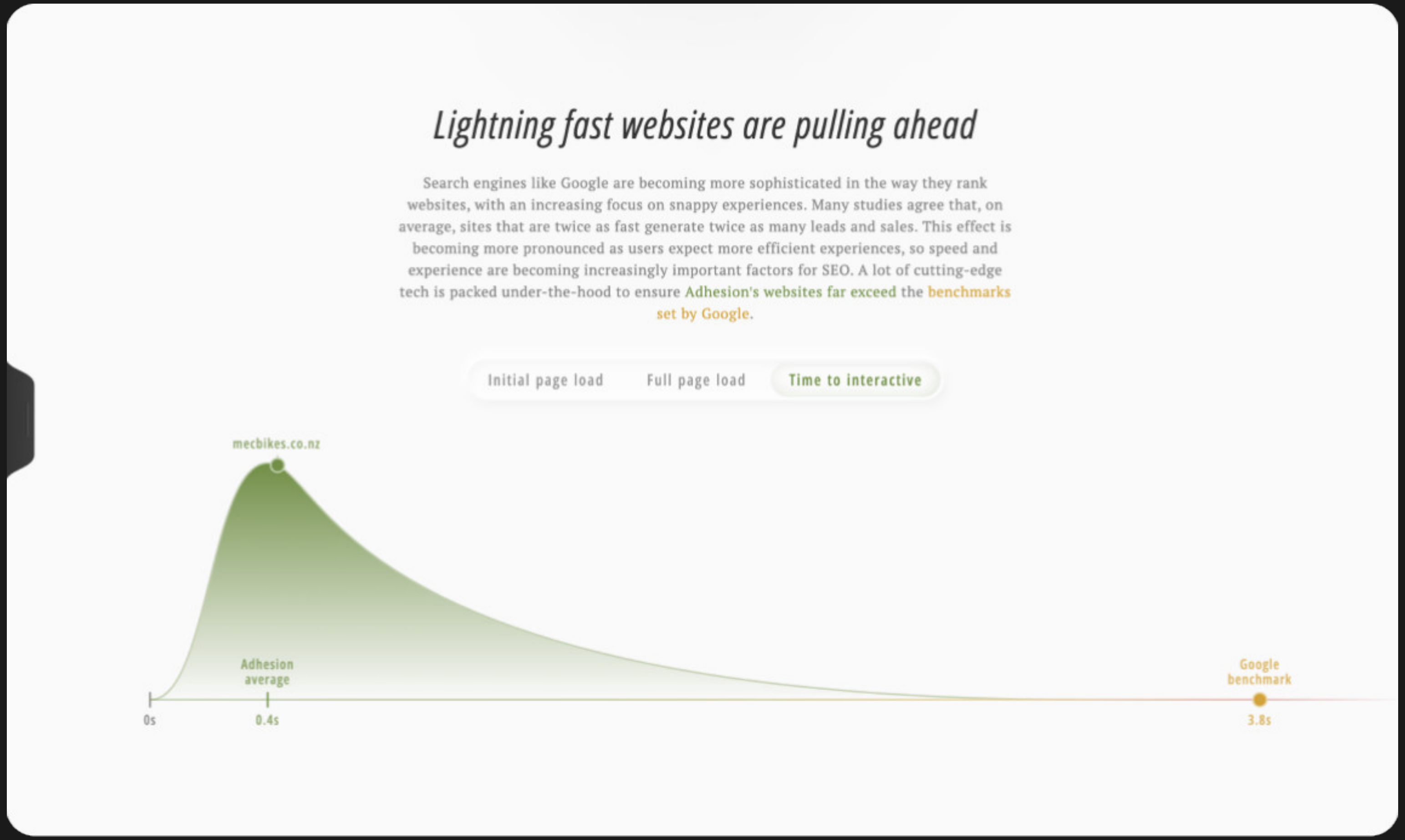
Page optimisation — This template would be demanding as there are several websites that users can filter through, each requiring relatively large files. On top of optimising these file sizes (and the timing of requests) as much as practical, it was important for all the other content on the page to work with negligible file sizes and requests.

This is why we built things like the interactive chart (bottom) using JSX-embedded SVG code that could efficiently render the visualisation (on an as-needed basis). Because the SVG was built inline with JSX, it could dynamically change its shape, using any appropriate data it received (e.g. when the filter dropdowns are used to change which website is being viewed). As a result, these elements effectively add zero load/compute time. I explain this in more technical detail on the next slide.

Filters provide quick access to relevant website work, with tracking to support product research



Collapsible sidebar allows for immersive showcase of work that can be scrolled through


Lightning fast websites are pulling ahead

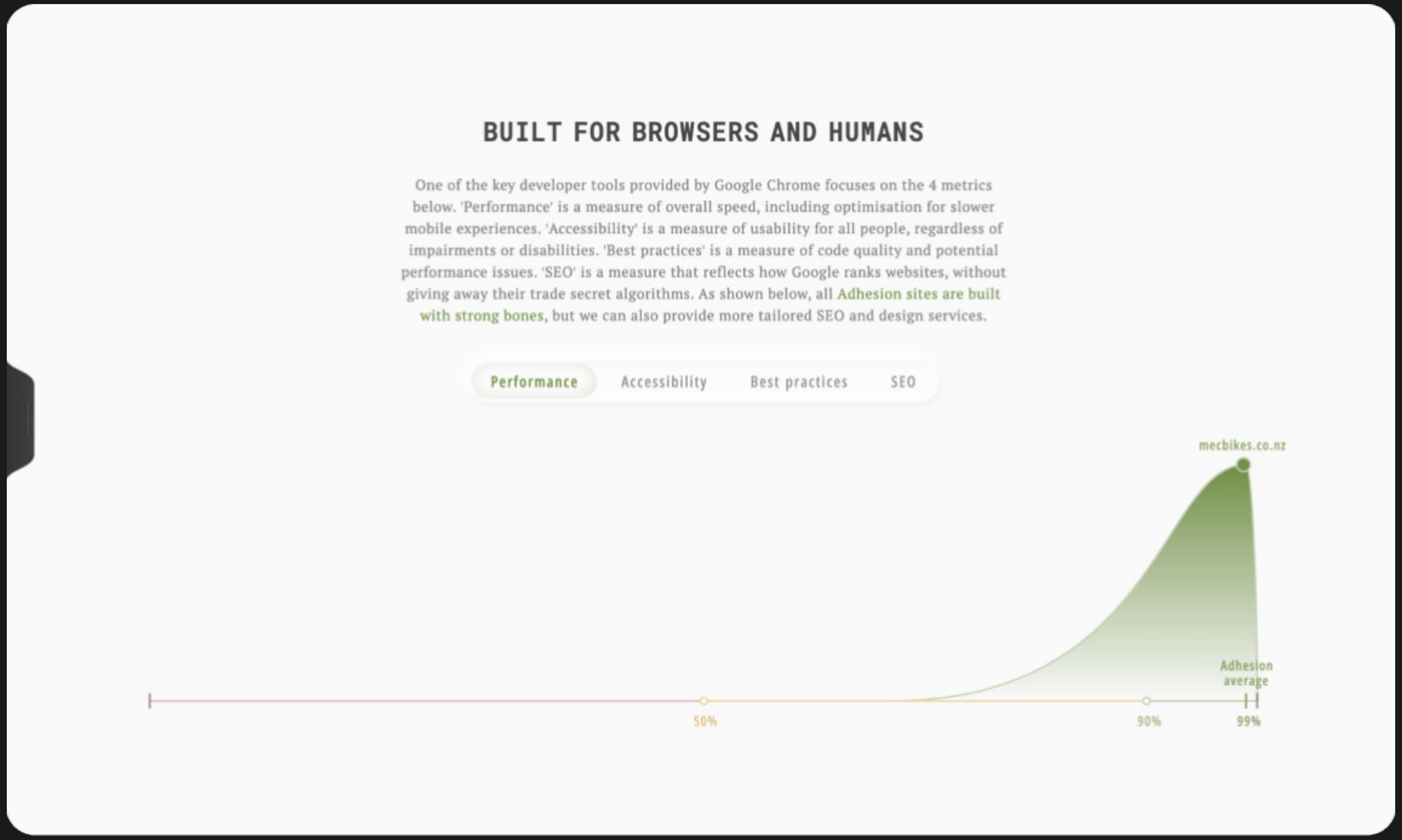
Search engines like Google are becoming more sophisticated in the way they rank websites, with an increasing focus on snappy experiences. Many studies agree that, on average, sites that are twice as fast generate twice as many leads and sales. This effect is becoming more pronounced as users expect more efficient experiences, so speed and experience are becoming increasingly important factors for SEO. A lot of cutting-edge tech is packed under-the-hood to ensure Adhesion's websites far exceed the benchmarks set by Google.

Dynamic SVG injected with real data, including the current site being viewed and industry benchmarks

Technical stuff — At build-time, this template (bottom right) is embedded with a dataset (d) containing a variety of metrics and dimensions for several websites. The JSX injects variables from the dataset (e.g. standard deviation) into the SVG code, to be returned for rendering. The SVG is re-rendered whenever the filters are changed, as this changes which subsets of the data are to be used.

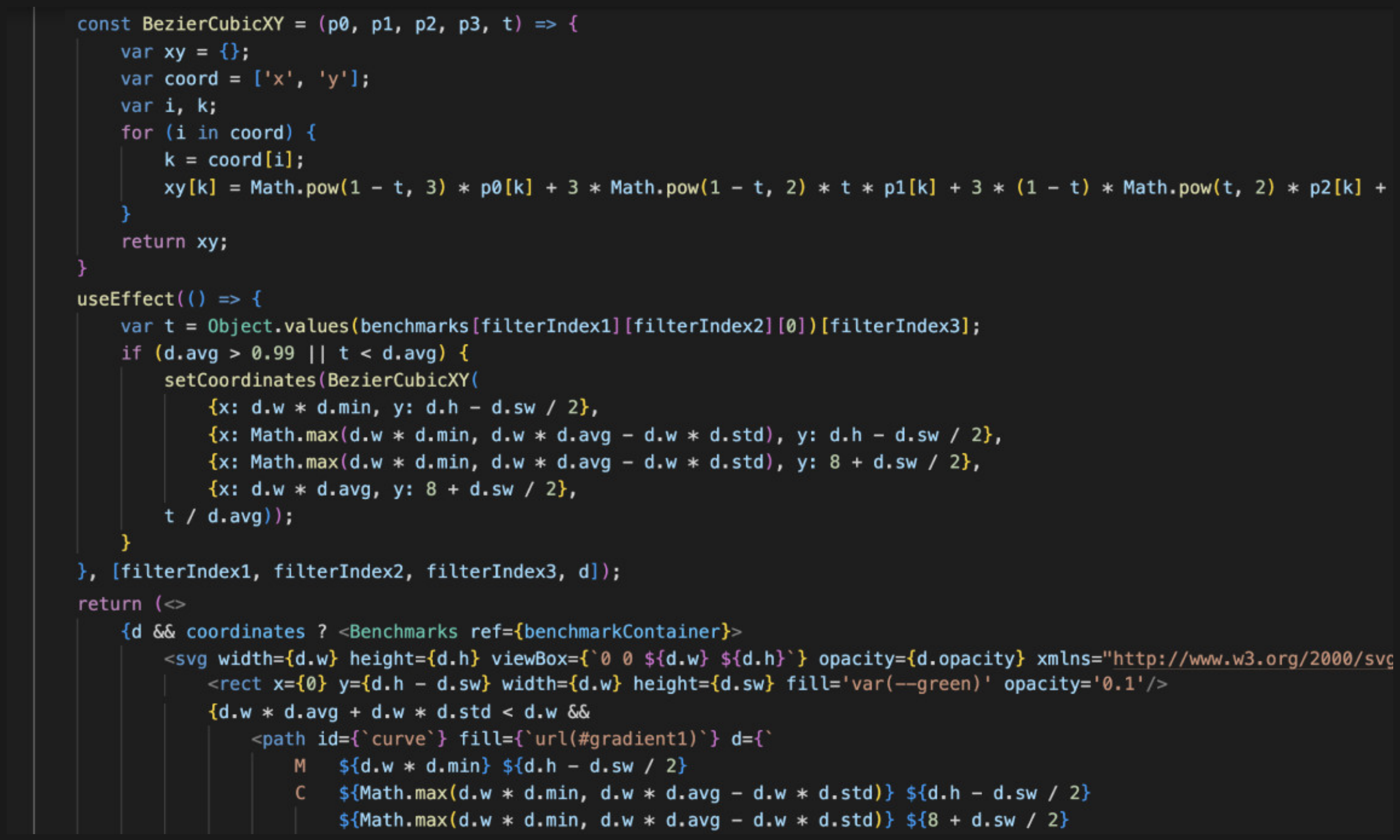
Admittedly, some of the JSX code can seem 'dense'. It applies standard formulas that are commonly used in mathematics to describe curves that have been normalized, normally-distributed and/or skewed (i.e. they are relatively efficient for our purpose).

The React code contains a bezier function which effectively accepts the data for a bezier curve and a data-point for a website (e.g. see 'mecbikes.co.nz'). The function returns the X and Y coordinates for positioning that data-point on the bezier curve.



BUILT FOR BROWSERS AND HUMANS

One of the key developer tools provided by Google Chrome focuses on the 4 metrics below. 'Performance' is a measure of overall speed, including optimisation for slower mobile experiences. 'Accessibility' is a measure of usability for all people, regardless of impairments or disabilities. 'Best practices' is a measure of code quality and potential performance issues. 'SEO' is a measure that reflects how Google ranks websites, without giving away their trade secret algorithms. As shown below, all Adhesion sites are built with strong bones, but we can also provide more tailored SEO and design services.



```
const BezierCubicXY = (p0, p1, p2, p3, t) => {
    var xy = {};
    var coord = ['x', 'y'];
    var i, k;
    for (i in coord) {
        k = coord[i];
        xy[k] = Math.pow(1 - t, 3) * p0[k] + 3 * Math.pow(1 - t, 2) * t * p1[k] + 3 * (1 - t) * Math.pow(t, 2) * p2[k] +
    }
    return xy;
}
useEffect(() => {
    var t = Object.values(benchmarks[filterIndex1][filterIndex2][0])[filterIndex3];
    if (d.avg > 0.99 || t < d.avg) {
        setCoordinates(BezierCubicXY(
            {x: d.w * d.min, y: d.h - d.sw / 2},
            {x: Math.max(d.w * d.min, d.w * d.avg - d.w * d.std), y: d.h - d.sw / 2},
            {x: Math.max(d.w * d.min, d.w * d.avg - d.w * d.std), y: 8 + d.sw / 2},
            {x: d.w * d.avg, y: 8 + d.sw / 2},
        t / d.avg));
    }
}, [filterIndex1, filterIndex2, filterIndex3, d]);
return (<>
    {d && coordinates ? <Benchmarks ref={benchmarkContainer}>
        <svg width={d.w} height={d.h} viewBox={`0 0 ${d.w} ${d.h}`} opacity={d.opacity} xmlns="http://www.w3.org/2000/svg
            <rect x={0} y={d.h - d.sw} width={d.w} height={d.sw} fill='var(--green)' opacity='0.1'/>
            {d.w * d.avg + d.w * d.std < d.w &&
                <path id={`curve`} fill={`url(#gradient1)`} d={`
                    M   ${d.w * d.min} ${d.h - d.sw / 2}
                    C   ${Math.max(d.w * d.min, d.w * d.avg - d.w * d.std)} ${d.h - d.sw / 2}
                        ${Math.max(d.w * d.min, d.w * d.avg - d.w * d.std)} ${8 + d.sw / 2}
```

Summary — Thank you for your interest in my work. I value being given opportunities to apply my various skills while managing complex projects. I hope I have demonstrated how I am able to collaborate with others to scope and plan projects, contribute to high-level decisions, and then dive in to deliver powerful solutions. Of course, this would not have been possible without the contributions of the business' director, senior developer, content creator, SEO specialist and others.

After some content refinement by the business, this new website will be launched in Q3 of 2023. Following the great success we had with the previous site, it will be interesting to see the impact this one has for SEO and customers, as well as the business' brand and employees.