CLEARCODE

AdTech/MarTech Platform Development:
How To Design, Build, and Launch a Working Platform Within 4 Months

AdTech & MarTech Development: How To Design, Build, and Launch a Working Platform Within 4 Months

The online advertising and marketing industries are nearly as old as the online world itself.

The moment that marked their beginning was on October 27, 1994, when the first-ever banner ad appeared online:

The first ever banner by AT&T appeared on HotWired (known now as wired.com) on October 27, 1994.

And if a user **clicked on the ad**, they were taken to this page, known as a **landing page**:

AT&T's landing page for their You Will ad campaign.

Image on left: The first-ever banner ad by AT&T appeared on HotWired.com on October 27, 1994.
Image on right: AT&T's landing page for their "You Will" ad campaign.

AT&T's banner ad on HotWired kickstarted the two industries as we know them today.

Since then, thousands of companies have entered the markets to solve complex problems and optimize processes through innovation.

As a result, the current marketing-technology landscape now looks like this:

Produced by Scott Brinker (@chiefmartec), Anand Thaker (@AnandThaker), and Blue Green Brands.

Chief Marketing Technologist's 2018 Marketing Technology Landscape is a consolidated list of over 6,800 advertising- and marketing-technology vendors.

The online advertising and marketing industries can be divided into two main sides.

On one side you have **companies that supply the technology** (AdTech and MarTech vendors) and on the other side are **companies that use the technology** (agencies and brands), with both sides facing their own fundamental challenges:

- **AdTech and MarTech vendors**: Maintaining a competitive edge over their rivals and delivering value to their clients.
- **Agencies and brands**: Reducing commissions paid to vendors and intermediaries, eliminating fees associated with using white-labelled platforms, gaining transparency into media-buying processes, and maintaining control and ownership of their data.

In addition, there also lies a range of business challenges that affect all companies wanting to build new AdTech/MarTech platforms or expand their existing technology:

- Discovering whether the solution will actually solve the end user's problem with the least possible time and cost investments.

- Avoiding risk of project failure and budget blowouts.
- Finding the required amount of technical resources that have the skills, knowledge, and experience needed to design, build, and release high-performance advertising and marketing technology.

For all these challenges there is a solution.

In this guide, we aim to highlight the different ways companies, from vendors to agencies, can design, build, and launch a working AdTech or MarTech platform within four months.

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CHAPTER 1

Designing and Building Custom AdTech/MarTech Platforms From Scratch

When budding technology companies first started exploring the online advertising and marketing industries, they were presented with only one option—build the software from the ground up.

Since then, a number of alternatives have emerged (listed below) to help companies reduce costs and resource requirements. However, there's still a growing need for custom-built AdTech and MarTech platforms.

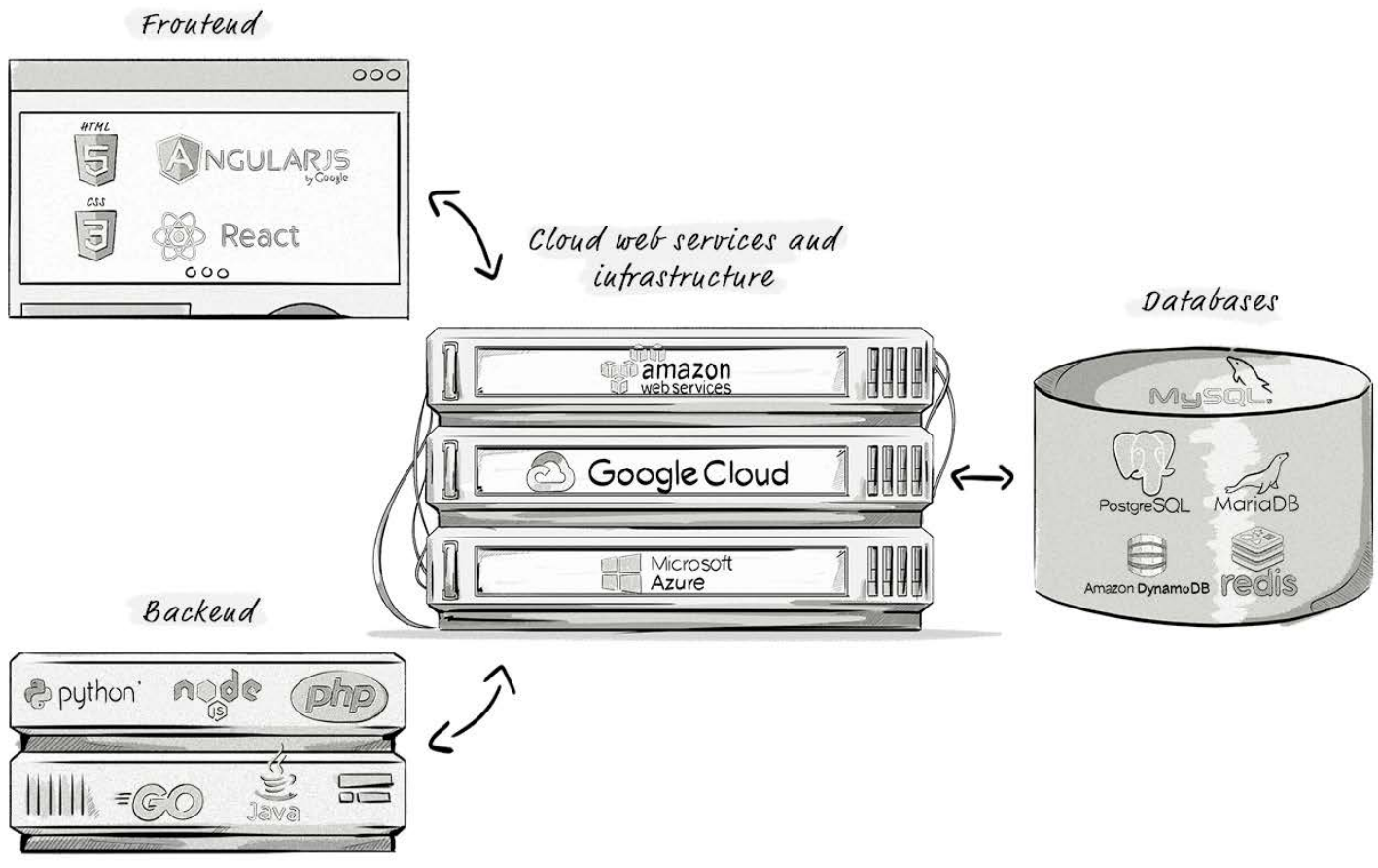
What is a Custom AdTech/MarTech Platform?

The process of building a custom AdTech or MarTech platform involves either starting with a blank slate or expanding an immature solution (e.g. a platform that either doesn't work properly or was poorly built).

What's Involved in Designing and Building Custom AdTech and MarTech Platforms?

While each AdTech or MarTech project is unique and has its own technical and business requirements, almost all projects will require selecting the right tech stack—i.e. the infrastructure, programming languages, and frameworks for the project.

Below is a brief overview of the options available when selecting an AdTech or MarTech project's tech stack.



While it is by far the most resource-, cost-, and time-extensive option available to vendors and agencies, building advertising and marketing technology from the ground up provides a number of serious business advantages.

Benefits of Custom AdTech/MarTech Development

Control Over the Features and Roadmap

The sheer number of AdTech and MarTech products available on the market means that identifying and choosing the right tools and platforms has become a daunting and time-consuming task.

Certain tools offer unique features, but they rarely give you the possibility to strip away the functionalities you don't really need. Such huge overlap across your advertising and marketing stacks means that you end up paying for features you don't even use.

Custom AdTech and MarTech has the advantage of controlling which features you build and add to the product's roadmap, which not only allows you to create a platform that meets your needs 100%, but also enables you to utilize your funds more effectively.

Reduction of Media Fees and Commissions (Especially From White-Labeled Solutions)

The markup of most AdTech platforms typically ranges between 10–30%. There is also little transparency in the display-advertising world these days (despite the recent push from brands and advertisers), and various hidden margins can often emerge along the way.

However, by building your own AdTech platforms, you can virtually bypass these fees and commissions charged by self-serve or white-labeled platforms—platforms that allow you to change the logo and user interface but provide limited customization capabilities—but the savings vastly depend on the size of your annual media budget.

Below is a rough estimation of the cost savings involved in building your own demand-side platform (DSP):

Media spend	Effective DSP commission	Commission paid to the DSP	Operational costs (infrastructure + engineering + operations)	Potential savings
$100m	15%	$15m	$2.5m	$12.5m*
$50m	15%	$7.5m	$2m	$4.5m*
$25m	15%	$3.75m	$1.75m	$2m*
$10m	15%	$1.5m	$1.5m	$0.0m*

All yearly figures

*Does not include the cost of building or acquiring the technology

It is also worth noting that adding a DSP or any other AdTech platform to your company's technology stack can increase the overall value of your company, which may greatly benefit companies of all sizes.

Data Ownership

Although most SaaS-based AdTech and MarTech platforms provide their clients with an easy-to-use user interface and zero infrastructure maintenance, there is an important tradeoff and ultimate deal breaker for many companies: **data ownership.**

Ownership of technology and data, rather than using a third-party solution, gives the advantage of better adaptability and compliance with privacy regulations.

This is where custom, on-premises tools begin to make sense, as you are able to host the technology and data on your own infrastructure. This advantage is impossible to overlook and presents a strong selling point for custom AdTech solutions, especially when you consider Apple's Intelligent Tracking Prevention feature, and of course, the mighty GDPR.

The General Data Protection Regulation (GDPR) went into effect on May 25, 2018, and is the most game-changing data-privacy law ever introduced in the European Union. The regulation entails significant internal changes in privacy policy, and AdTech providers are required to implement new data-security measures. Having, or building, your own custom AdTech platforms will make complying with the GDPR less challenging.

Among other changes, with the GDPR in force, companies will have to inform data subjects (users) about a data leak within 72 hours. Also, each data subject will have the right to be forgotten. This essentially means that the controller must erase a user's personal data, cease its further dissemination, and have third parties halt processing of the data upon request.

If building AdTech and MarTech platforms from scratch doesn't suit your business needs, however, and you want to save development time and costs, there is another option: **build new AdTech and MarTech products on top of existing platforms.**

CHAPTER 2

Building New AdTech and MarTech Platforms on Top of Existing Platforms

Even though online advertisements and marketing messages are commonplace in the digital world, few appreciate the complex technological processes and innovations that take place behind the scenes.

The AdTech and MarTech industries are filled with high-performance, sophisticated technology.

For companies wanting to build custom platforms for their own needs and save on development time and costs, there are a number of solid options available to them.

BEESWAX

Beeswax is an AdTech company that offers a programmatic cloud, consisting of the industry's first Bidder-as-a-ServiceTM (BaaS) platform—a fully customizable real-time bidding (RTB) platform, aka bidder.

With BaaS, companies can connect to an array of RTB supply sources to access display, mobile, and video inventory, just as they would with a traditional demand-side platform.

However, the real magic happens with Beeswax's APIs.

Buzz: REST APIs for campaign management and reporting

The Buzz APIs allow companies to build their own workflows and reporting dashboards from their own user interface.

Stinger: An extensible bidder

Beeswax's Stinger is the bidder component of Bidder-as-a-ServiceTM. It enables companies to develop their own algorithms, set their own targeting parameters, and manage numerous campaigns.

What Can Companies Build With Beeswax's Programmatic Cloud?

While Beeswax allows companies to develop a range of solutions, such as custom reporting dashboards, building a customizable bidder provides the most advantages.

Customizable Bidder

One of the main advantages of building a customizable bidder with Beeswax is that you can completely tailor it to your needs, which benefits companies that have specific use cases and a strong desire to innovate.

Some of the main things a company can do with a custom bidder include:

- Utilize their first-party data for media transactions.
- Develop their own algorithms based on their needs and business goals and run them in the custom bidder.
- Create new attribution models.
- Develop new creative formats.
- Run high-performance video, mobile, and display ad campaigns.

RTBkit

RTBkit is an open-source real-time bidder that businesses can customize and expand to suit their specific needs. It was originally created by a company called Datacratic, but has since been acquired by Beeswax.

RTBkit is similar to Beeswax in that it provides the foundations of a bidder and allows companies to create custom solutions on top of it. The main difference between the two is that Beeswax will host your custom bidder for you, whereas with RTBkit, you'll need to supply your own infrastructure. If the latter isn't an issue for you, there are numerous cost savings to be had with RTBkit.

However, it's important to remember that there are a number of both technical and business areas to consider when choosing between Beeswax and RTBkit.

BIDSWITCH

BidSwitch, a product from engineering company IPONWEB, provides infrastructure for supply-side platforms (SSPs) and demand-side platforms (DSPs) so they can integrate with one another.

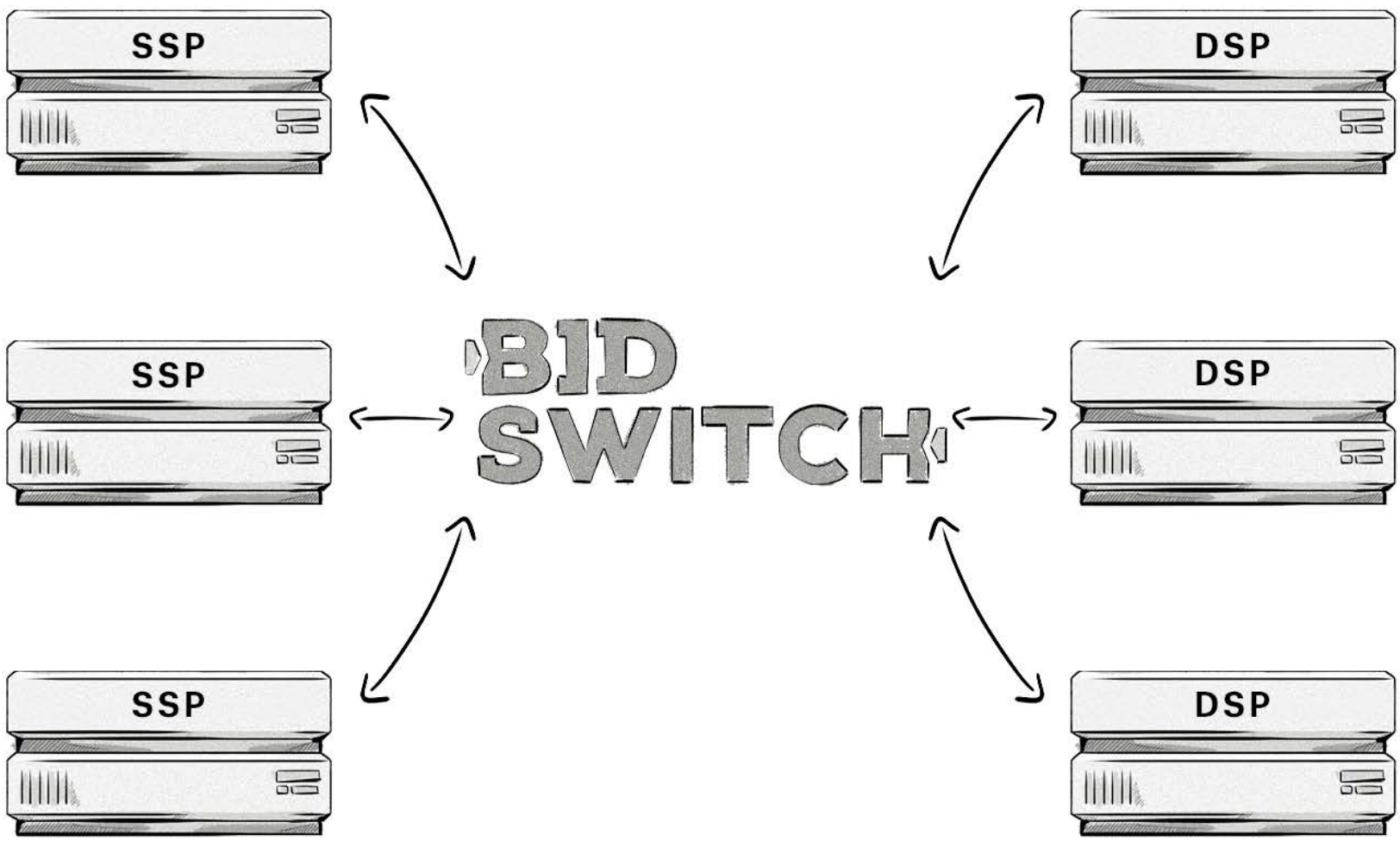
Due to the fragmented ecosystem, SSPs and DSPs face many common problems, including:

- **Integrating with new partners.** An integration between an SSP and a DSP can take two to four weeks.

- **Maintaining connections with existing partners;** for example, updating the integration when an API is updated.
- **Listening to the bidstream.** For DSPs, receiving large volumes of bids from multiple SSPs means they have to invest heavily in infrastructure, which produces large overheads and running costs.

How Does BidSwitch Work?

By providing a central, one-to-many connection point, BidSwitch allows SSPs and DSPs to trade digital media without having to invest in the infrastructure and to avoid the lengthy integration process.



In order for a DSP to access inventory from SSPs via BidSwitch, the DSP would simply need to connect to BidSwitch. From there, BidSwitch would then connect the DSP to the various SSPs.

The Benefits of Connecting With BidSwitch

Connecting with BidSwitch lets both media buyers and sellers:

Reduce Integration Time

The time it takes to integrate with different platforms (and maintain these integrations) can be significantly reduced.

Eliminate Incompatibility

While the IAB's OpenRTB project is designed to be the standard protocol and lingua franca of real-time bidding transactions, the fact is that many AdTech vendors utilize different protocols for conducting media transactions, therefore compatibility issues between partners emerge. BidSwitch unifies the various protocols and APIs to ensure both SSPs and DSPs are speaking the same language.

Access Different Types of Inventory

Regardless of whether a DSP wants to buy display, mobile, video, or native inventory, BidSwitch provides access to all different types of inventory from a single connection point.

AppNexus first appeared on the online advertising scene in 2007 as an ad exchange for programmatic media buying, back when real-time bidding (RTB) emerged.

Since then, it has morphed into one of the biggest AdTech companies in the world, offering both media buyers (agencies and advertisers) and publishers a range of advertising-technology solutions.

Apart from its core products, AppNexus also offers companies a number of options to build their own custom solutions.

What Solutions Can You Build On Top of AppNexus?

On the Demand Side

Here are just a few of the solutions Ad Tech companies, advertisers, brands, and ad agencies can build on top of AppNexus:

Programmable Bidder

The auctions that take place in real-time bidding may be lightning fast, but building a fully fledged bidder from scratch requires a significant time commitment.

AppNexus has made it easier for all parties on the buy side to purchase media programmatically with their Programmable Bidder, so instead of building your own bidder, you can now just create your own algorithms and insert them into the AppNexus Programmable Bidder. This not only provides better targeting but also optimizes media purchases.

An Advanced Reporting and Analytics Platform

The key to a successful online media campaign lies in knowing the most about the person on the other end (the visitor).

By pulling log-level data from AppNexus and displaying it on a custom reporting and analytics dashboard, you can present data in a visual way and combine it with data from your web analytics tools, transactional systems, etc. This enables you to discover more about your target audience and get a better view of the performance of your campaigns, which will allow you to make decisions with a positive impact.

Custom Dashboard or Meta-DSP

For companies that run a number of in-house campaigns and campaigns for their clients, creating specialized and custom dashboards lets them run, manage, and report on numerous campaigns across different demand-side platforms (DSPs). This type of custom dashboard/platform is often referred to as a meta-DSP.

Apart from building the solutions mentioned above, you can also monetize data and optimize campaigns by pushing audience segments and data assets to the AppNexus DSP or exchange.

On The Supply Side

Publishers and supply-side platform (SSP) vendors can build the following solutions on top of AppNexus.

Header-Bidding Solution

Header bidding has changed the way publishers sell their inventory and has resulted in more yield.

By utilizing AppNexus' header-bidding solution, you can create a custom header-bidding platform that lets you open available inventory to a range of different buyers at the same time and sell your inventory at the highest possible price.

Custom Dashboard

Large publishers run a number of different campaigns, often across different SSPs.

By adding AppNexus data and functionality to your existing custom dashboard (or by building one), you can run, manage, and analyze multiple media deals across various exchanges all from one place with just a few clicks.

Similar to platforms on the buy side, platforms on the sell side can also monetize data and maximize yield from their inventory by creating audience segments and pushing them to the AppNexus SSP and exchange.

Building on Top of Existing Solutions via APIs

Apart from utilizing the above ready-to-go platforms to build new AdTech/MarTech platforms, companies can also gain access to more inventory and data by integrating with existing vendors and developing new tools.

These are some of the existing AdTech and MarTech vendors companies can integrate with to access more data and inventory:

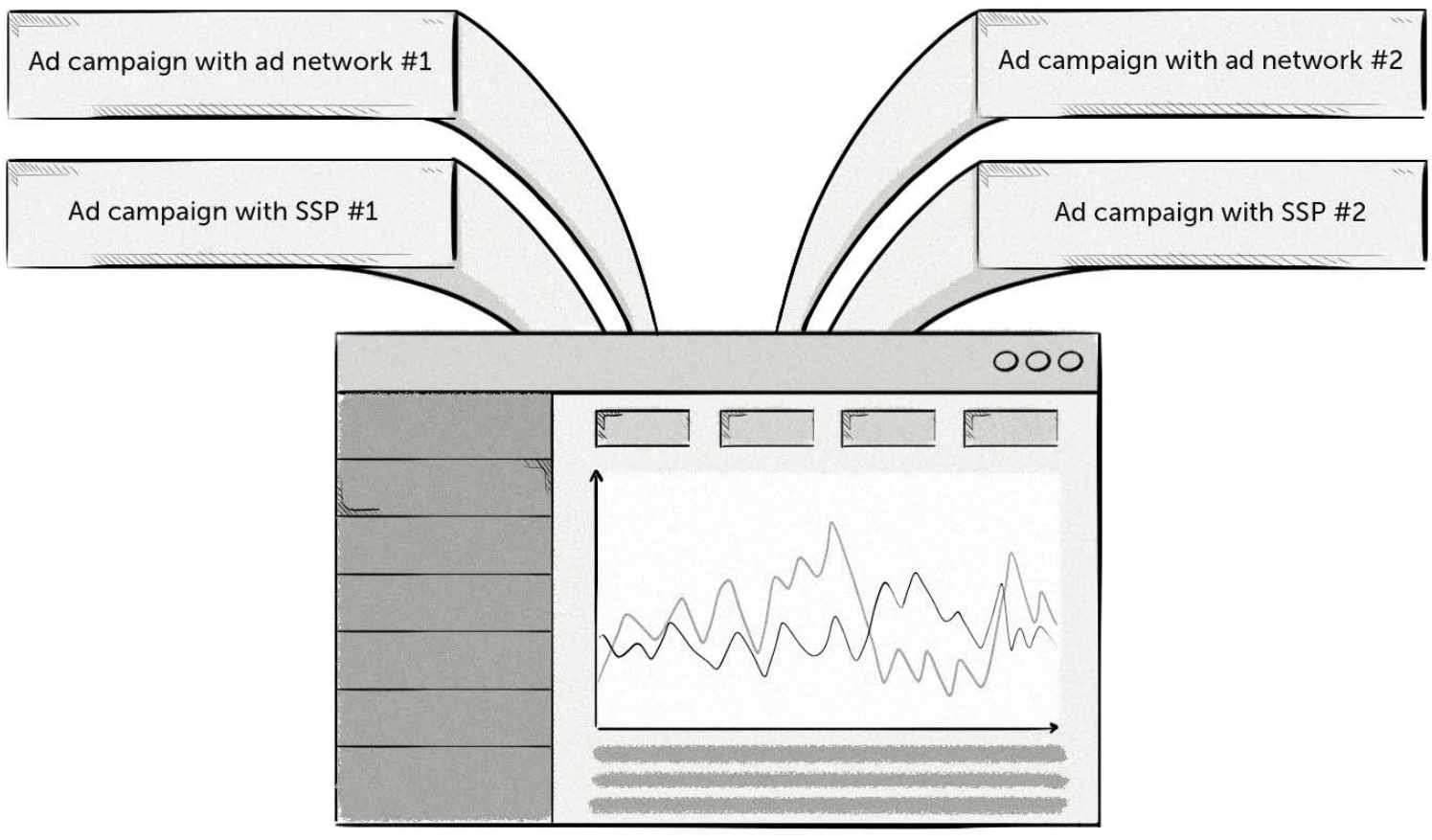
Below are some examples of the types of tools companies can build:

Automated Processes and Workflows

By integrating your existing platforms with other AdTech or MarTech platforms, you can improve productivity by automating certain processes. For example, you could create a campaign template so that your media traders can set up and manage campaigns more quickly and automatically adjust bids across different campaigns.

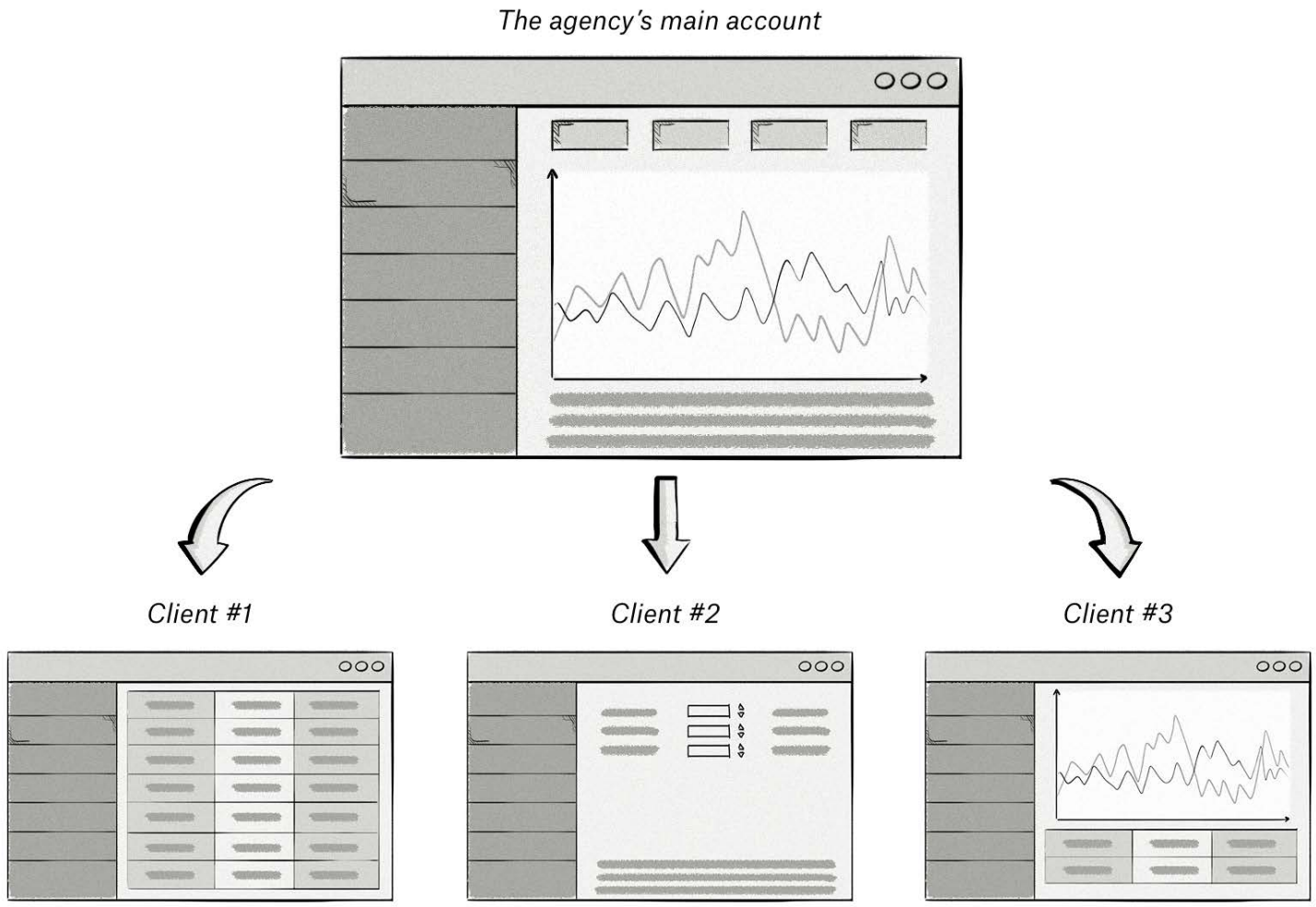
Custom Reporting Dashboards

Companies could build a dashboard that pulls data from all of their campaigns running across different partners to gain a detailed overview of their statistics and metrics.



This provides the company with a clear overview of all their campaigns and the ability to make immediate changes to optimize performance.

Building a custom reporting dashboard would also allow agencies to provide each of their clients with real-time data about the performance of their respective campaigns.



Individual dashboards for each client

The agency could build a custom reporting dashboard and provide their clients with a login to their individual dashboard, while the agency would only need to use a single account to manage all their clients' campaigns.

Benefits of the Above Options to Build Custom Solutions

Whether you want to develop your own AdTech platform via Beeswax, BidSwitch, or AppNexus, or build a custom solution by utilizing APIs from existing platforms, there are a number of benefits on offer from this type of development, compared to building a solution completely from scratch, including:

Shorter time to market: Building on top of existing solutions and utilizing APIs eliminates the need to build certain fundamental features or tools that are typically needed when developing advertising and marketing technology platforms, allowing you to release your custom solution sooner.

More transparency: Similar to the build-it-from-scratch option, developing new solutions on top of existing platforms provides insights into key areas that are typically shrouded in secrecy, such as the cost of media and performance reports.

Flexibility: Although you aren't building an AdTech or MarTech platform from scratch, there's still a lot of room to move when it comes to feature selection, as many of the platforms mentioned above cater to companies with specific use cases.

CHAPTER 3

3. Expanding Existing Platforms With Custom Integrations

Lastly, for companies looking to access more inventory and data, there are a few options where they can integrate existing AdTech/MarTech platforms with protocols and libraries.

OpenRTB

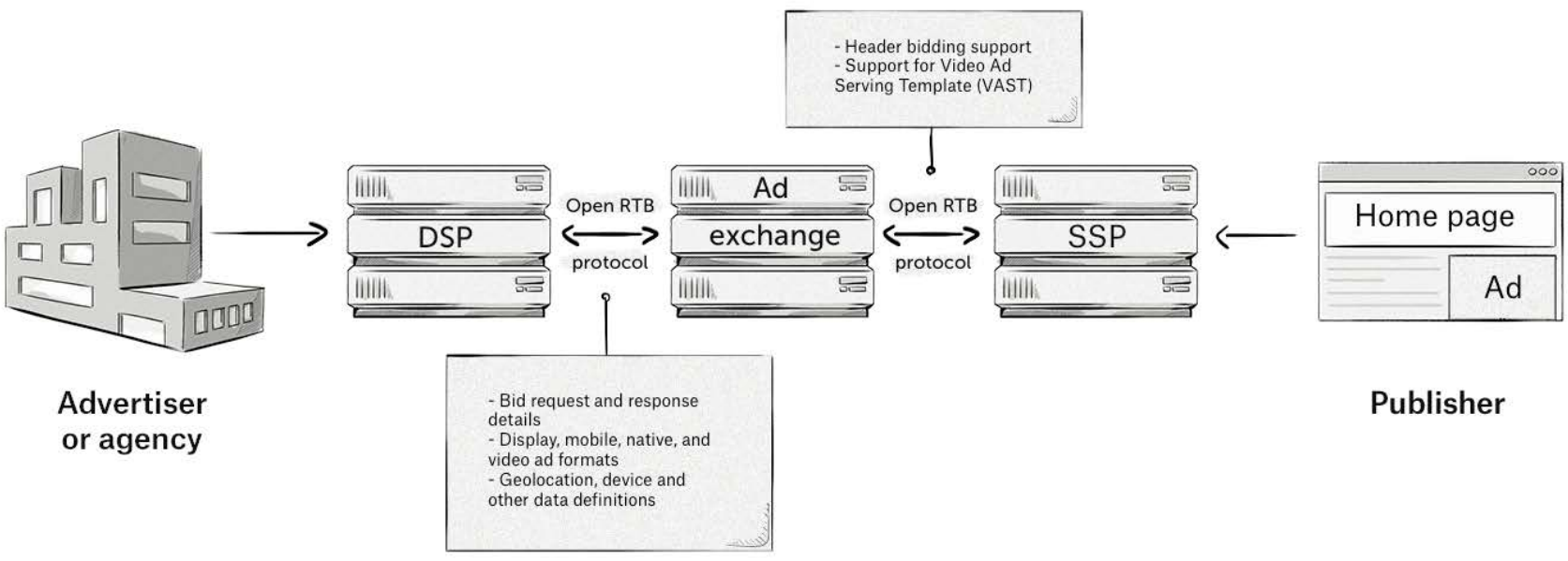
Founded in November 2010, the Real-Time Bidding (RTB) Project—formerly known as the OpenRTB Consortium and also known as simply OpenRTB—consists of a collection of online advertising technology companies from both the buy side and sell side.

The aim of OpenRTB is to encourage growth, innovation, and adoption rates of real-time bidding by creating a list of industry standards to help unify communication between AdTech platforms during RTB media buys.

For these reasons, OpenRTB is designed to act as a lingua franca between buyers and sellers.

Below are just some of the specifications of the OpenRTB protocol (currently version 3.0):

- Bid request and response details.
- Deal ID support for private marketplaces (PMP).
- Support for various ad formats and placement types, e.g. display, mobile, native, and video.
- Geolocation, device, and other data definitions.
- Header-bidding support.
- Support for Video Ad Serving Template (VAST).



Benefits of Implementing the OpenRTB Protocol

With the use of a common language, AdTech platforms can be more confident about scalability and their ability to integrate with a host of other platforms and tools on the market.

More specifically, OpenRTB can help supply-side platforms, demand-side platforms, and ad exchanges:

Save maintenance and integration costs: Open RTB eliminates the need for SSPs and DSPs to support different integrations with multiple exchanges and offers flexibility when choosing a new platform to work with.

Reduce time to market: Vendors can implement multiple integrations without added development costs for each additional integration. Some customization may be necessary, but the core implementation will be the same thanks to a unified protocol.

Improve efficiency: Ensures faster bidding by reducing duplicate code, automates workflows by eliminating manual and compute-intensive tasks, and allows for a larger volume of media to be transacted by minimizing the amount of communication that needs to take place between the various platforms.

Finally, because the OpenRTB standard has already been widely adopted with other tools, making it the basis of a new tool renders it infinitely more attractive (and usable) for potential customers.

Drawbacks of the OpenRTB Protocol

The main drawback of the OpenRTB protocol is that it requires a large technical commitment to implementing AdTech and MarTech platforms, as you typically have to restructure the codebase.

Prebid.js

Prebid.js is an open-source JavaScript library that helps publishers make their inventory available to more demand sources via header bidding.

Header bidding (aka pre-bidding, advance bidding, and holistic yield management) is a process that enables publishers to simultaneously collect multiple bids from a number of demand sources (not only from their ad server) on all of their ad inventory prior to a sale.

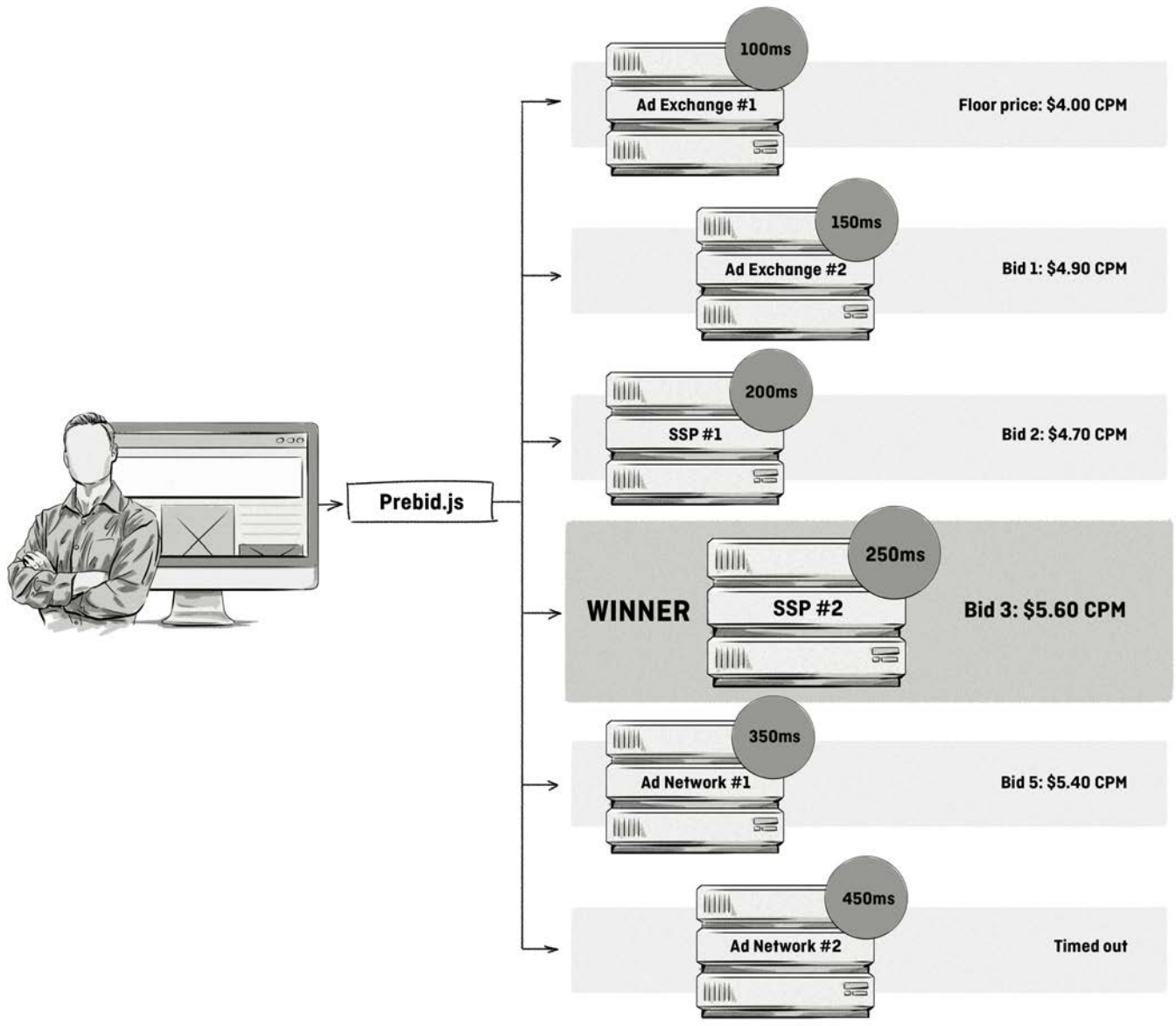
This process allows publishers to “see” which demand sources (e.g. DSPs and ad networks connected to ad exchanges and SSPs) are placing the bids, as well as the monetary value of their bids, allowing them to get the highest cost per mille (CPM) possible.

As bids are received before a publisher’s ad server is called, advertisers are able to compete with a publisher’s premium deals, meaning they have a better chance of winning the impression and publishers earn more money for their inventory.

In order for publishers to run header bidding, they need to implement some sort of header bidding wrapper (aka container).

While there are many open-source and closed header-bidding solutions, Prebid.js is by far the most widely used.

Here's a brief overview of how Prebid.js and header bidding work:



A step-by-step explanation of what's happening in the image above:

1. A user accesses a publisher's website containing the Prebid.js wrapper.
2. The Prebid.js wrapper sends the ad request to multiple AdTech platforms.
3. The SSPs and ad exchanges hold an auction and receive bids from multiple DSPs.
4. The highest bidder wins and sends their ad back to the publisher's site to be displayed to the user.

Now that we've looked at the main ways in which companies can build new AdTech/MarTech platforms and expand their existing technology, let's take a look at the development process.

CHAPTER 4

The Development Process

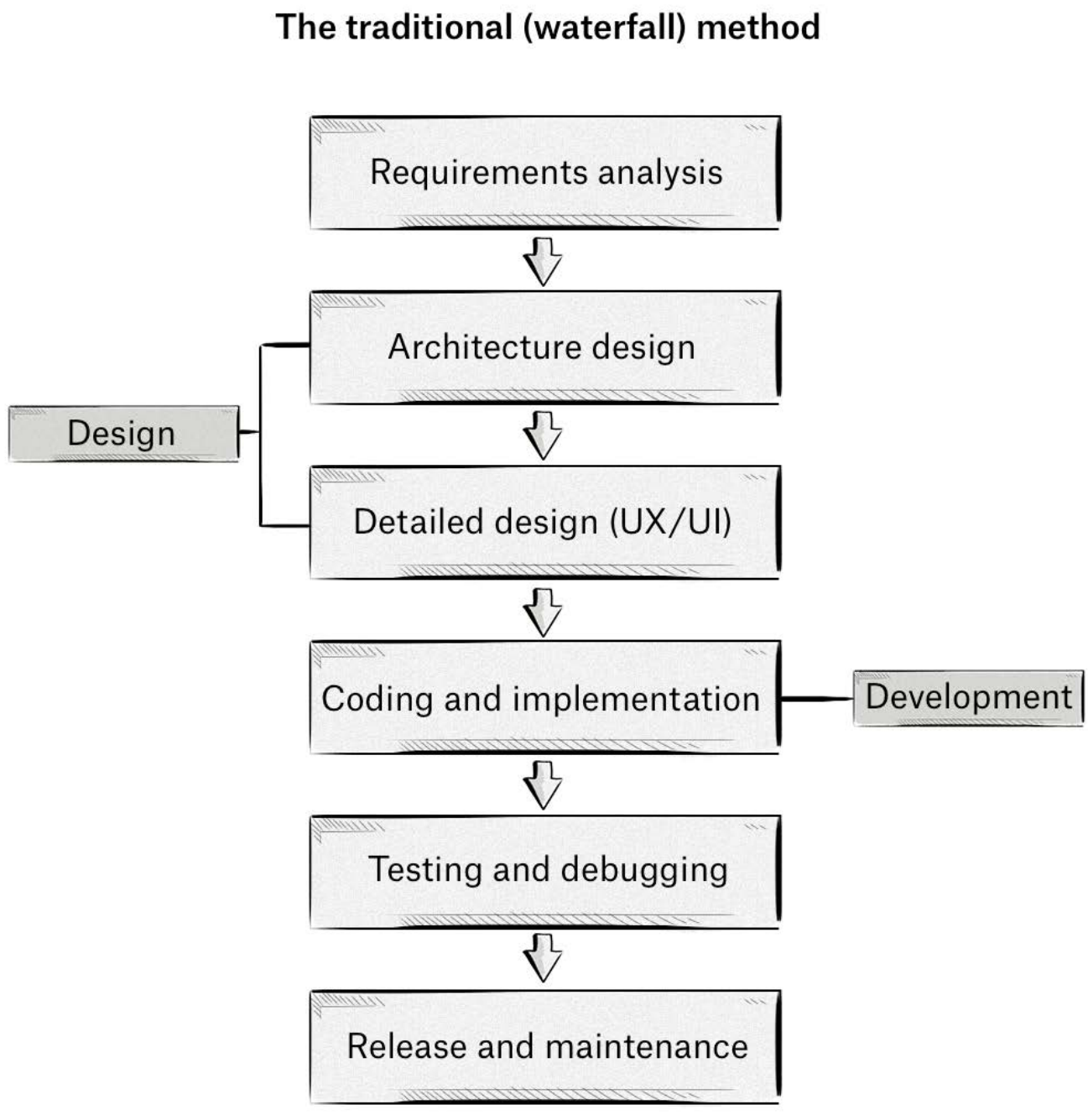
The way in which software is designed, developed, and released has changed a lot over the past few decades, with many companies and teams moving away from the traditional model and taking a more agile approach to software development.

The Traditional Software-Development Model

The traditional method (aka the waterfall method) used in software development dates back to the 1950s and is based on the project-management method used in manufacturing and construction industries.

This traditional model aims to develop software one stage at a time and involves many months of planning and even years of development, frequently resulting in project failure and budget blowouts. Typically, the project starts at the first stage and then, once completed, moves onto the next stage, often without the possibility of turning back to previous stages.

Below is an outline of the development process of the traditional method:



Over the years, this model has received its fair share of criticism, with many software-development professionals stating that it is too rigid, doesn't allow for any changes to be made based on new information, and adds a lot of risk to the project.

To overcome these shortcomings, a number of new software-development approaches emerged during the 1990s, including:

- Rapid application development (RAD)
- Scrum
- Extreme programming (XP)
- Feature-driven development

All of the above are now considered to be components of a very broad array of development models known as **agile methodologies**.

Agile Software Development

There is an ongoing debate within the software-development industry as to what constitutes *agile development.*

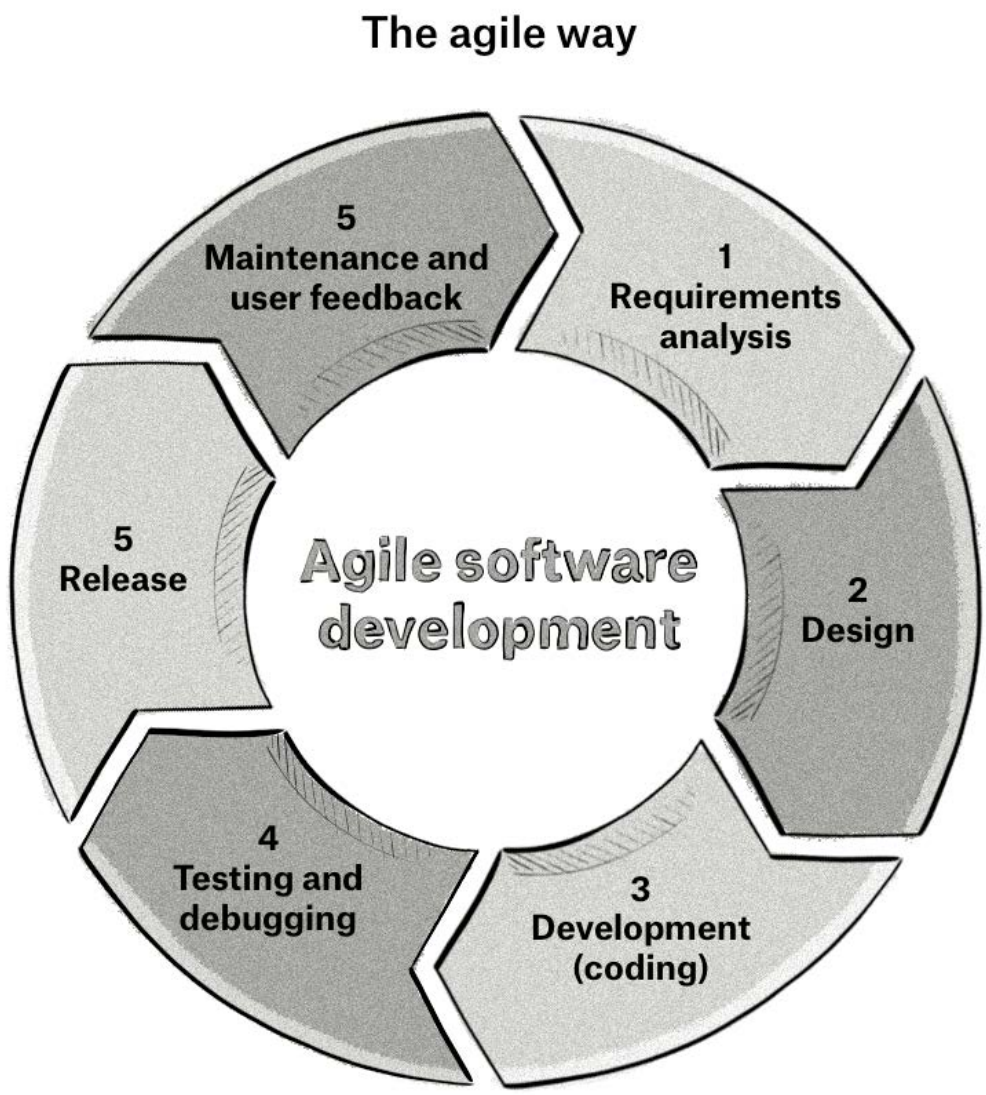
Perhaps the most accurate definition can be found in a document created by 17 development practitioners known as *The Manifesto for Agile Software Development:*

> **Individuals and interactions** over processes and tools.
> **Working software** over comprehensive documentation.
> **Customer collaboration** over contract negotiation.
> **Responding to change** over following a plan.

As you can see from the points listed above, agile methodologies center on obtaining the best results possible, rather than following a strict, predefined plan.

The beauty of agile methodologies is that they are, well, agile. Instead of committing to a particular model, software-development teams can choose the best elements from multiple agile development models based on the requirements of the project.

The stages of agile development also vary compared to the traditional development process:



Compared to the rigid and linear format of the traditional development method, agile methodologies take an incremental approach. This typically means that the project is broken down into smaller parts and worked on over the course of two to four weeks *(known as sprints)*.

How Agile Methodologies Help Reduce the Risk of Project Failure

Although risk is inherent in all software-development projects, many risk factors can be reduced and even eliminated by following agile methodologies instead of the traditional development method.

In particular, agile methodologies can reduce the following risk factors:

Time: The longer a project is in development, the longer it is exposed to internal and external factors, such as market changes.

Budget blowouts: By building the software incrementally (agile) rather than all at once (waterfall), companies can reduce the risk of budget blowouts by avoiding situations where money was spent on features that later became obsolete or needed to be changed, therefore optimizing their funds.

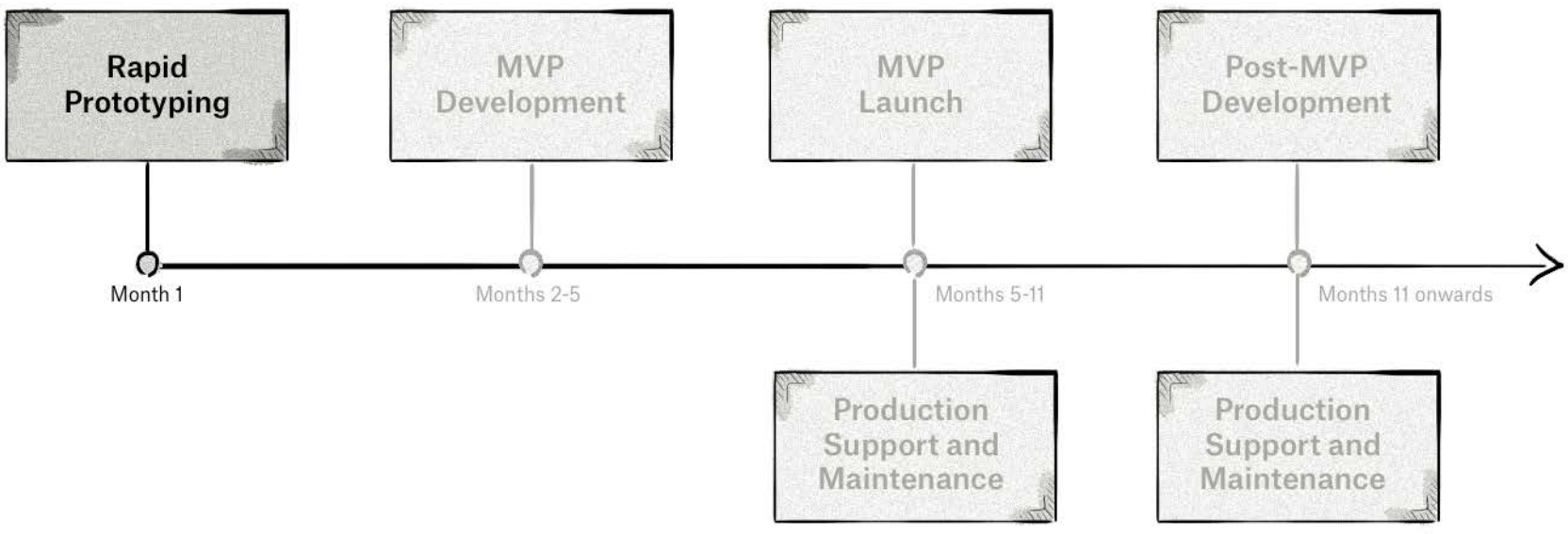
Market conditions: Agile development allows companies to not only release a working product to initial users sooner, but also the development team is able to react to changing market conditions and set the project on a different course; such a situation would likely lead to the project failing with the waterfall method.

Unvalidated ideas: Whether a startup or corporation, all businesses need to validate their original ideas by proving that people would actually use the product. With agile development, companies can validate ideas and test assumptions with less of a financial and resource commitment than with the waterfall method, and ultimately develop a product that's in line with the needs of their end users.

Now that we know the benefits of the agile methodologies, let's look at how to apply them to produce a working AdTech or MarTech platform within four months.

Rapid Prototyping

Duration: *One month*



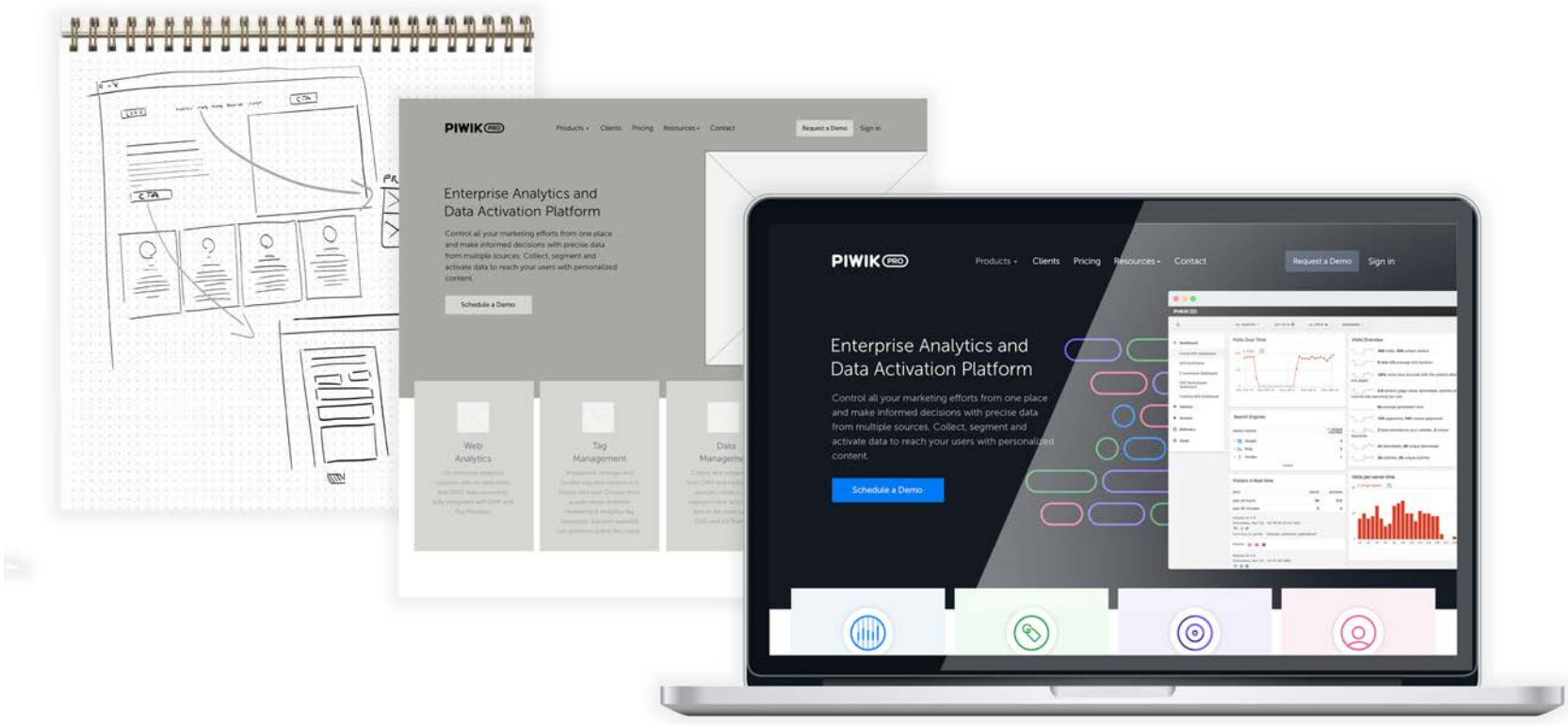
Rapid prototyping is a design process used to produce an interactive, working model of the AdTech or MarTech platform. The goal of rapid prototyping is to obtain feedback from key stakeholders and make incremental improvements.

The rapid prototyping process typically involves producing the following:

Wireframes and mockups: Sketches and hand-drawn diagrams that represent the visual hierarchy of the AdTech or MarTech platform.

Low-fidelity prototype: A representation of the product—typically in grayscale—that focuses on the structure, information hierarchy, and visual hierarchy.

High-fidelity prototype: A highly visual representation of the product that includes clickable elements.



The image above shows the transition from wireframes and mockups to a low-fidelity prototype to the high-fidelity prototype.

The Main Benefits of Rapid Prototyping

Bring Ideas to Life

While screen flows and wireframes help you visualize your AdTech or MarTech platform, an interactive rapid prototype lets you experience it, which not only allows you to clearly present your product's goals, but discover and fix usability flaws early on as well.

Showcase Product to Key Stakeholders

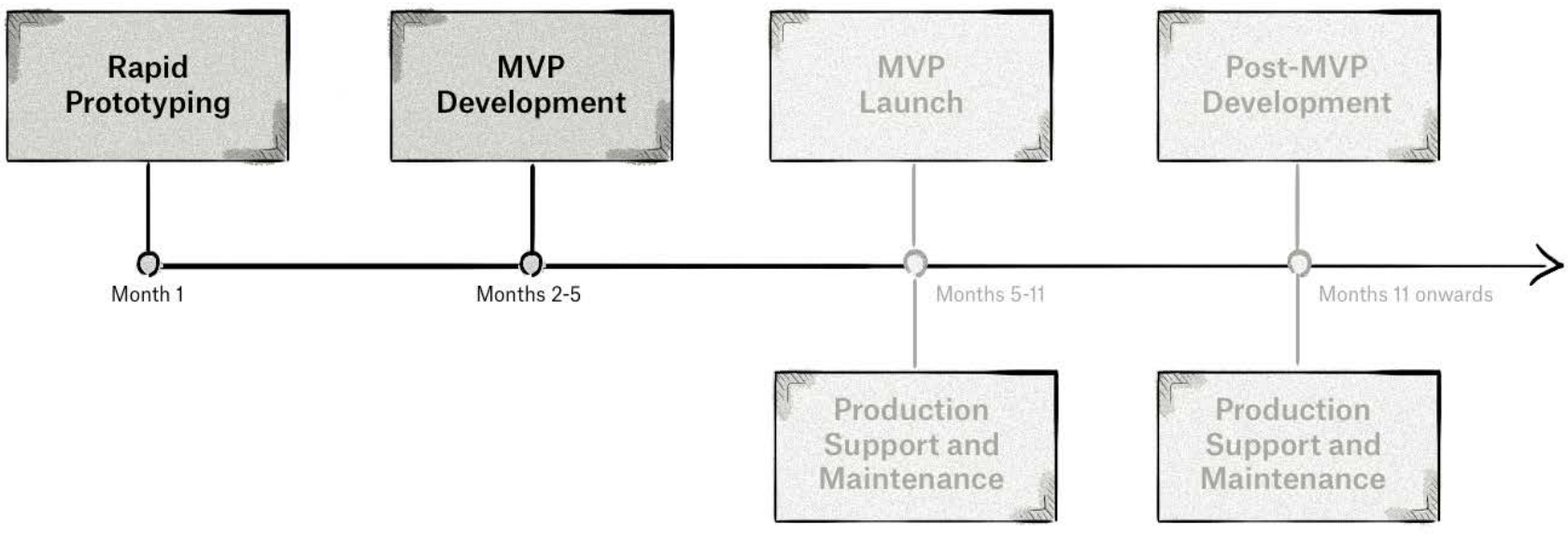
By creating an interactive model of your AdTech or MarTech solution, you are able to demonstrate your ideas, goals, and vision to all stakeholders—whether they are your in-house marketing team, investors, or even clients—and gain early feedback from them so you can make immediate improvements.

Set Foundation for Development

In software development, there are a number of key crossover moments where things can go wrong, mainly when the project moves from the design team to the development team. However, a lot of the risk can be mitigated if you have a rapid prototype, as this will provide a clear and visual guide for the development team.

MVP Development

Duration: A typical MVP takes about three months (six two-week sprints) to build.



Contrary to its name, an MVP is not a minimum product—it is your project's first working version and the first step in gaining valuable feedback from initial users that will improve the product and shape its roadmap.

MVPs first emerged as a way to help startups get their idea in front of their target audience in the shortest time possible. However, because of the early success startups gained by validating ideas and gaining feedback, MVPs are now also used in large software-development projects.

The goal of the MVP-development phase is to deliver a working product that can be presented, deployed, and tested by the initial customers or users.

Typically, the project is organized in two-week iterations (sprints), which include the following activities:

Sprint planning: An initial meeting at the beginning of each sprint where the team estimates and chooses the items to work on from the backlog, sets the sprint's goal, and plans time for other activities, such as backlog refinement or spikes (see below).

Development: The stage where the platform's code is written, tested, and deployed to the testing environment.

Some of the main activities undertaken in this stage include:

- **Use of design patterns** save time by applying known and reusable solutions to commonly occurring problems in software development.
- **Peer code reviews.** To ensure the highest quality of code and minimize the number of bugs, code is reviewed by other team members.
- **QA automation**—including unit, integration, performance, and UI tests—identify and eliminate performance issues and bugs.
- **Continuous integration and continuous delivery** merge all the developer's code into the shared mainline several times a day to prevent integration problems.

Product backlog refinement: Allows the client and the development team to assess whether the backlog is up to date, contains appropriately prioritized user stories and tasks, and that the items at the top of the backlog are ready for development.

Spikes: Time allocated for the user stories that couldn't be estimated during the sprint planning (e.g. those that require further research).

Sprint review: The stage where the development team presents the deliverables of the sprint in the staging environment.

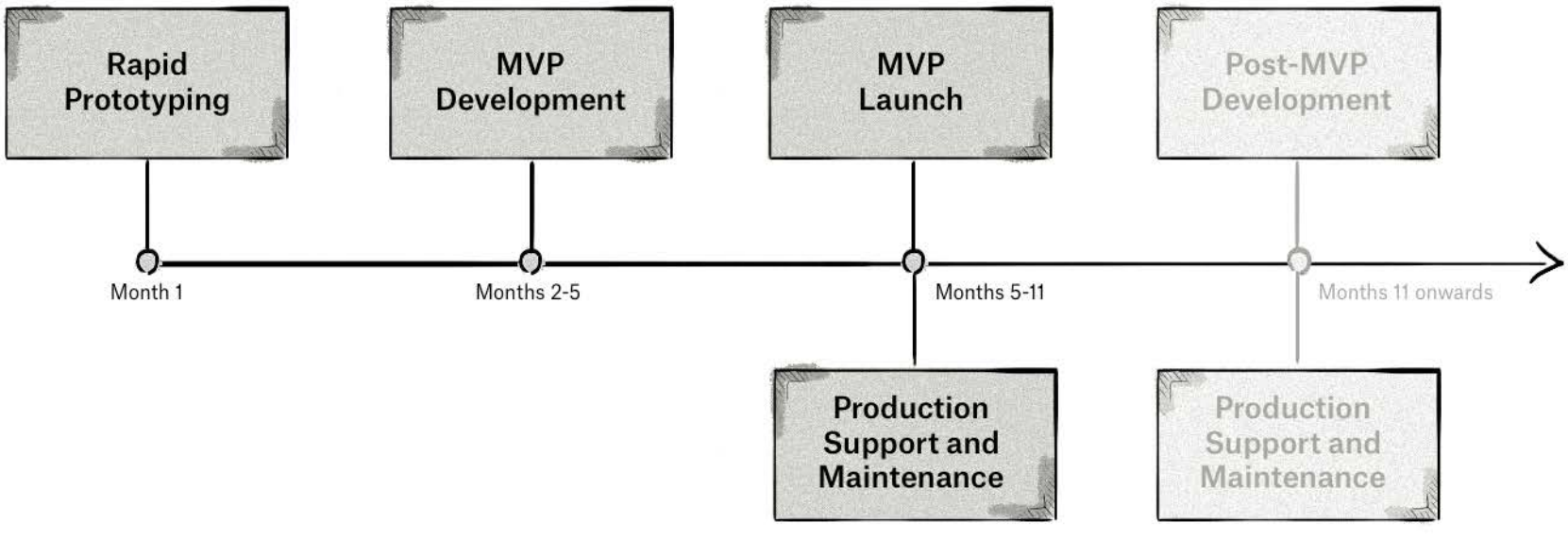
Retrospection: A meeting where the development team looks for obstacles that need to be removed to optimize the development process.

The image below illustrates what a typical MVP-development phase looks like:

MVP Development					
SPRINT#1	Day 1	Day 2	Day 3	Day 4	Day 5
Week 1	Sprint planning Development →			Product backlog refinement →	
Week 2	Development →		Spikes		Sprint review & retrospection
Week 3	Sprint planning Development →			Product backlog refinement →	
Week 4	Development →		Spikes		Sprint review & retrospection
SPRINT#2	Day 1	Day 2	Day 3	Day 4	Day 5
Week 1	Sprint planning Development →			Product backlog refinement →	
Week 2	Development →		Spikes		Sprint review & retrospection
...					

MVP Launch

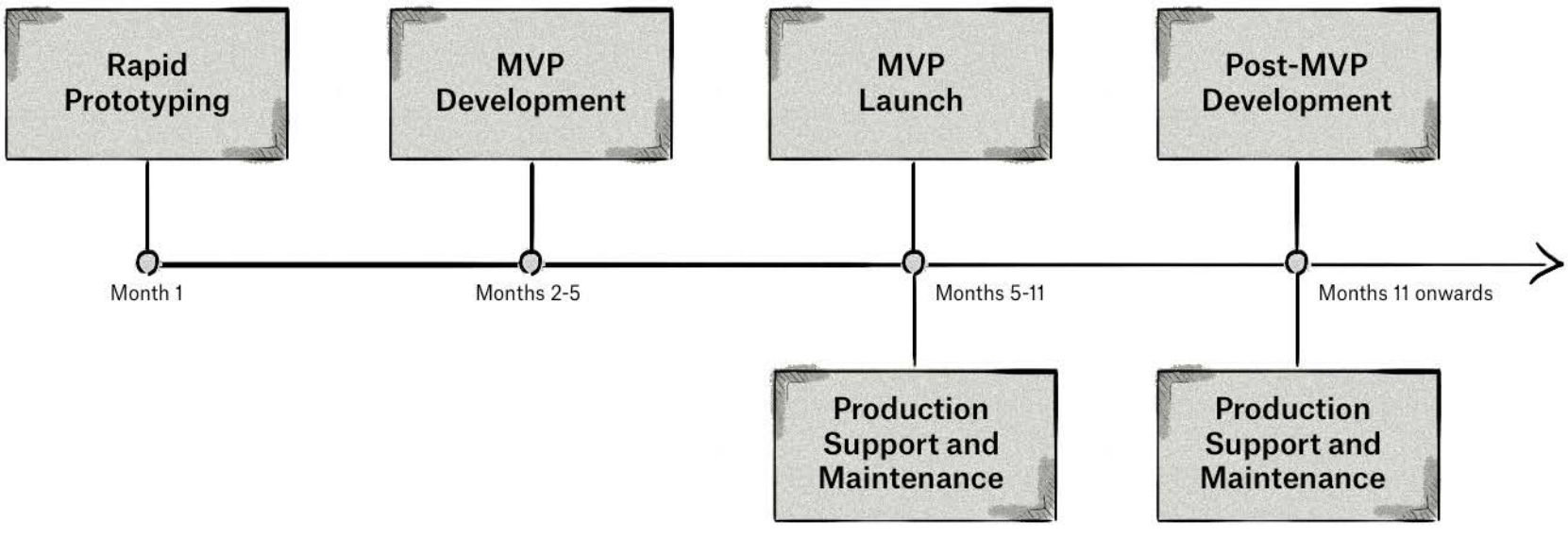
Duration: *The MVP is typically tested for two to six months, but can vary greatly.*



When it is time to launch the MVP to initial users or customers, the development team will run user-acceptance tests and correct any outstanding issues, work closely with the client to gather feedback for the post-MVP-development phase, and provide production support and maintenance (see below).

Post-MVP Development

Duration: *Two-week sprints on an ongoing basis*



Once the MVP has been released to the initial users, the development team will:

- Make changes to the platform based on user and stakeholder feedback.
- Continue the development of the platform via an agile development process.
- Provide support and maintenance of the production server(s).
- Monitor the platform and respond to emergencies.

Production Support and Maintenance

Duration: *Ongoing*

During the MVP launch and post-MVP development phases, the development team will provide production support and maintenance services to:

- **Proactively monitor the platform and the infrastructure** to detect and address issues before they affect the users of the platform.
- **Provide emergency support** to help with resolving issues outside of business hours.
- **Display issues** and their real-time status in a Kanban board.

CHAPTER 5

The Development Team

Now that you know how to build an AdTech or MarTech platform within four months, it's time to look at the various development options you have available.

In-House Teams

In-house teams consist of designers and developers employed or hired directly by the company.

The main advantage of having an in-house development team is the accountability factor. If the project fails or doesn't produce the desired results, the designers and developers are on the hook.

However, while most AdTech and MarTech companies—and even agencies—have their own in-house development teams, there are a number of disadvantages, including:

- A lack of skills, experience, and knowledge required to take on advertising- and marketing-technology development projects. This can also lead to a slow time to market.
- It can work out to be quite expensive hiring and employing developers on a regular and full-time basis, as you will have to pay them the same salary during quieter, non-development stages, such as when the initial users are testing the MVP.
- Hiring designers and developers directly also means you'll be stuck with a bunch of HR-related issues, such as hiring new staff and jugging the staffing numbers (and knowing whether you should scale up your team or not).

Outsourcing or Body-Leasing Companies

Outsourcing or body-leasing companies are typically made up of hundreds of designers and developers that work on multiple projects at a time.

The only real advantage of using a body-leasing company is the cost savings. However, there are very few body-leasing companies that have the specialized skills, experience, and knowledge needed to develop advertising and marketing technology.

This means that the initial cost savings can quickly be lost, as you'll end up having to invest in fixing problems, or worse, scrapping the product and starting from scratch.

Development Partner

A development partner is a company that specializes in a certain area of software development, such as AdTech and MarTech, and typically handles all of the project's technical areas from designing and building the software to maintenance and post-launch development.

Finding a development partner that specializes in AdTech and MarTech development can provide the same advantages and eliminate the disadvantages of having an in-house team.

The advantages of choosing a development partner include:

- Access to a team of experienced, skilled, and knowledgeable AdTech/ MarTech designers and developers.
- The development teams consist of all the required resources needed to start and complete an AdTech or MarTech project, including a project manager, tech lead, UX/UI designers, front-end developers, back-end developers, QA specialists and testers, and DevOps.
- You won't have to worry about scaling up and scaling down a team during the different development phases, meaning you'll be able to maximize the project's budget.
- They can handle all the technical requirements of the project, allowing you to focus on the business side—e.g. sales and marketing, as well as client acquisition.
- They can work alongside your in-house team to increase the time spent on development, enabling you to release the MVP sooner with more features.
- Apart from building the core product, a development partner can also develop new features that clients are requesting, but your in-house team doesn't have time to work on.

The disadvantages of choosing a development partner:

- Even though they eliminate the disadvantages of the in-house option, development partners still work out to be a bit more expensive than body-leasing companies. However, as stated above, paying more to build a quality product will save you money in the long run.

Below is a brief comparison of the above three options:

	Cost	Quality	Time to market
In-house team	High	Medium to high	Medium to fast
Body-leasing	Low to medium	Low to medium	Slow to medium
Development partner	Medium	High	Fast

CHAPTER 6

Case Study: Kanary NEST Demand-Side Platform (DSP)

Clearcode builds the Kanary DSP from scratch and gets it acquired by Silicon Valley-based advertising company Gravity4

About Kanary Nest

Kanary NEST provides advertisers with an easy way to buy display ads by using programmatic and real-time bidding (RTB) technology with fully transparent reporting on media spend, conversions, and commissions.

The aim of the Kanary project was to build a fault-tolerant, scalable demand-side platform (DSP) that optimizes the user experience and provides a clear and interactive user interface that even the most novice users can operate.

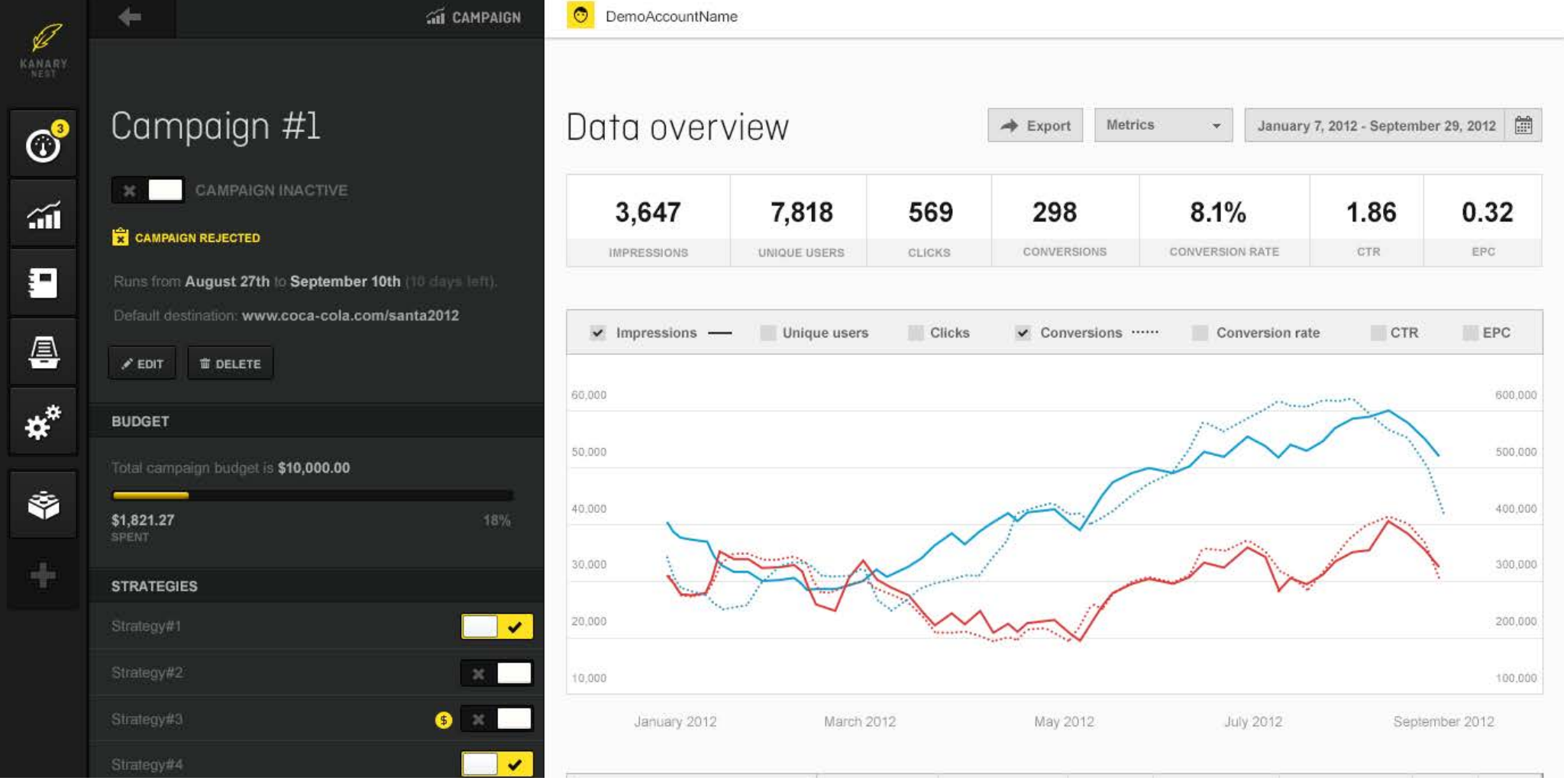
Establishing and creating a recognizable brand image and designing the UX/UI were also vital to the success of the project.

Goals and Challenges

- Build a high-performance DSP that could handle billions of bid requests.
- Display reports in real-time.
- Present the massive amounts of data in an easy-to-comprehend way so advertisers can understand their campaign's performance.

What We Did

- Scaled the infrastructure horizontally to enable the DSP to handle billions of bid requests.
- Utilized numerous backend frameworks and databases to ensure ultra-fast performance.
- Integrated the Kanary DSP with various AdTech platforms, including AppNexus and Nexage, to provide advertisers with access to a large amount of inventory.
- Created a simplistic user experience to help advertisers gain a clear understanding of their campaigns' performance and enable them to easily navigate around the platform.



The Kanary NEST user interface.

How We Delivered a Successful Project to Kanary NEST

- Drew upon our skills, experience, and knowledge of advertising-technology development, which allowed us to eliminate the steep learning curve and reduce the time spent planning the project.
- Built and released the MVP to initial beta testers to gain initial feedback, which helped us make immediate improvements and shape the DSP's roadmap.
- Adopted an incremental and agile development approach, which enabled us to release new and/or improved features every two weeks to advertisers.

Results

- The platform was featured at the TechCrunch Disrupt 2013 conference in New York and received a lot of positive feedback from attendees.
- In August 2014, Kanary NEST was successfully acquired by the online advertising giant Gravity4.

CLEARCODE

About Clearcode

Trusted AdTech and MarTech Development Partner

Clearcode is a full-service software development company that specializes in AdTech and MarTech development.

With offices in the US and Europe, our 100+ employees have partnered with startups and publicly traded companies to:

- Design and build custom AdTech and MarTech platforms from scratch.
- Build new solutions on top of existing, customizable platforms.
- Gain access to more inventory and data via custom integrations.
- Expand existing platforms by implementing new protocols (e.g. OpenRTB) and libraries (e.g. Prebid.js).

By adopting an agile and incremental approach, our development teams are able to help companies validate ideas sooner, reduce project risk, and release the software to initial users within four months.

To find out how our experience, skills, and knowledge can benefit your company, contact us for an introductory call via one of the channels below:

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