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AppDrag Cloud CMS & Cloud Backend

Development platform with cloud hosting for web professionals

White Paper:

A paradigm shift in web development technology & methodology

Abstract **3**

Background **4**

Why should web professionals migrate to the cloud? 4

Why web professionals have not yet migrated to the cloud? 4

How does AppDrag overcome the barriers to change for web professionals? 5

Technical analysis **7**

Cloud infrastructure 7

Scalability 7

High availability 7

Security 8

Performance 9

Dynamic Page Processor 12

High speed page processor 12

Integrated Cache system 12

Real Time Log 13

Cloud Backend **14**

Cloud DB 14

Cloud Functions / API Builder 15

PageBuilder **17**

Page Editor 17

Blog 20

Shop 21

In-page translation system 25

Source code edition **27**

PageBuilder 27

Advanced 28

Email Marketing **29**

Domains / Email / DNS / SSL Certificates **31**

Analytics & Dashboards **33**

Tools (Font convertor, Photo Gallery, SVG editor) **35**

Marketplace **38**

Competitors comparison **39**

Conclusion **40**

1. Abstract

The three primary challenges facing professional web developers today: efficiency, security and scalability. AppDrag is a development platform for web professionals. It is a fully integrated end-to-end technology covering backend development, front end development and powerful cloud hosting. The technology has been developed with the objective of streamlining web development through a powerful interface to reduce development time by up to 75% while providing a future-proofed, secure and completely scalable solution.

2. Background

99% of web professionals currently work with old-fashioned mono server CMS technologies like WordPress, Joomla, Drupal and others. Migration to cloud-based technologies has not occurred to any significant extent.

Why should web professionals migrate to the cloud?

Mono server CMS (like WordPress) face several serious legacy issues from the pre-cloud era. As websites are hosted on single servers, sites frequently become unavailable due to:

- Sudden influxes of heavy traffic;
- Hardware failure;
- Network interruption;
- DDoS and similar attacks.

Moreover, each year several million WordPress (and other CMS) websites are hacked due to new security breaches discovered in the CMS or in its plugins. Aside from service interruption, this results in substantial inefficiency due to the time required to update servers and install security patches for the CMS and plugins.

A further drawback of the mono server-hosted CMS is poor speed. When accessed from a location that is significantly distanced from the server a noticeable disimprovement in performance occurs.

Why web professionals have not yet migrated to the cloud?

Most cloud-based tools on the market currently are designed and built for low-level users. Examples include Wix, Weebly, Squarespace and Jimdo. They

are not widely used by web professionals due to their significant limitations in terms of customization, access to source code, poor html code output and poor/non-indexability by Google.

Prior to the advent of AppDrag, transitioning to a cloud-based approach required web professionals to re-educate themselves: learning NOSQL, new languages and cloud hosting architectures, a challenging and time-consuming process.

How does AppDrag overcome the barriers to change for web professionals?

AppDrag's backend 100% custom-written native and optimized code. This means that it overcomes the traditional limitations faced by other providers who rely on vast quantities of heterogeneous open source libraries. Using this approach, AppDrag comprehensively addresses the traditional inhibitors:

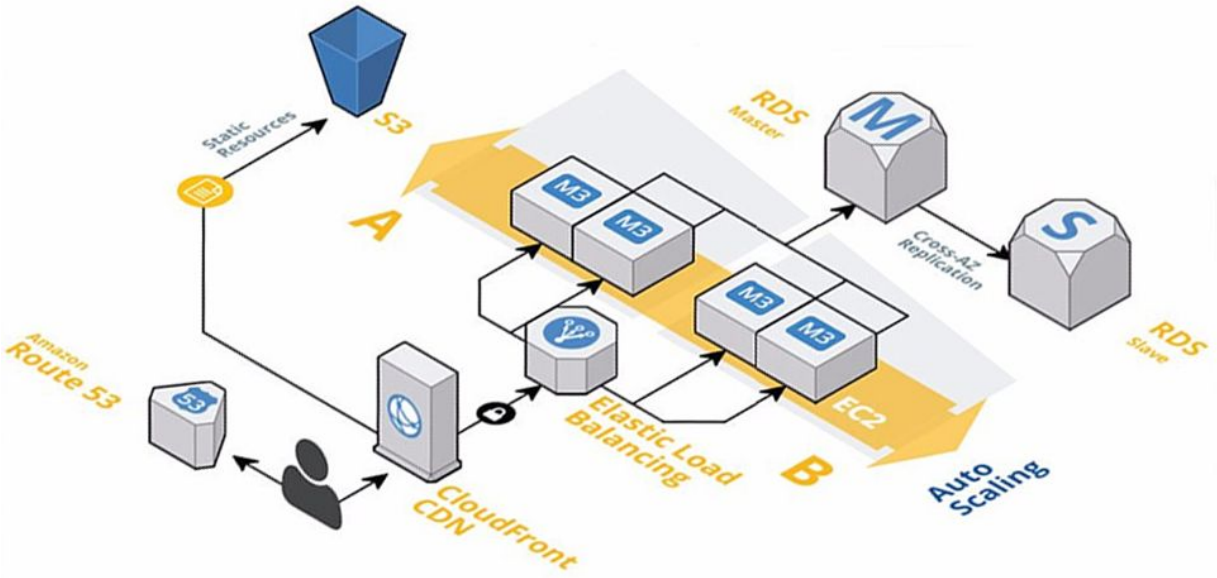
- **Efficiency:** Produces websites, blogs, ecommerce 75% faster than traditional development methodologies.
- **Customization:** Provides full access to clean HTML5 Bootstrap / CSS / JS source code.
- **Integration:** Seamless creation of databases and API's for advanced projects with Cloud Backend.
- **Familiarity:** Developers can use existing skills & knowledge with MySQL, NodeJS, Python, C#, Java and SQL so re-education is largely eliminated.
- **Performance:** Each website/backend is hosted simultaneously on thousands of cloud servers, with a global CDN (Content Delivery Network) covering 113 points of presence in the world.
- **Speed:** AppDrag's high-efficiency coding fully masters the processing pipeline up to the millisecond. This delivers incredibly low average response times of 150ms for cold requests and less than 50ms for cached requests.
- **Security:** AppDrag's has added 12 layers of security in addition to the highly secure AWS backbone.

This enables web professionals to offer world-class cloud hosting to customers at vastly improved margins, without worrying about security patches, server updates & maintenance issues, performances issues, migrations, hackers, DDOS, etc.

3. Technical analysis

a. Cloud infrastructure

AppDrag's cloud infrastructure is built on top of the reliable, scalable, and multi-regional **Amazon Web Services (AWS)**.



Architecture of AppDrag high availability cloud hosting

i. Scalability

Resources are auto-scaled based on immediate requirements. For websites ranging from just a few to millions of users, the experience is seamless as the infrastructure provided by AppDrag is responsive to the website's usage requirements. This ensures high performance levels and very fast response times.

ii. High availability

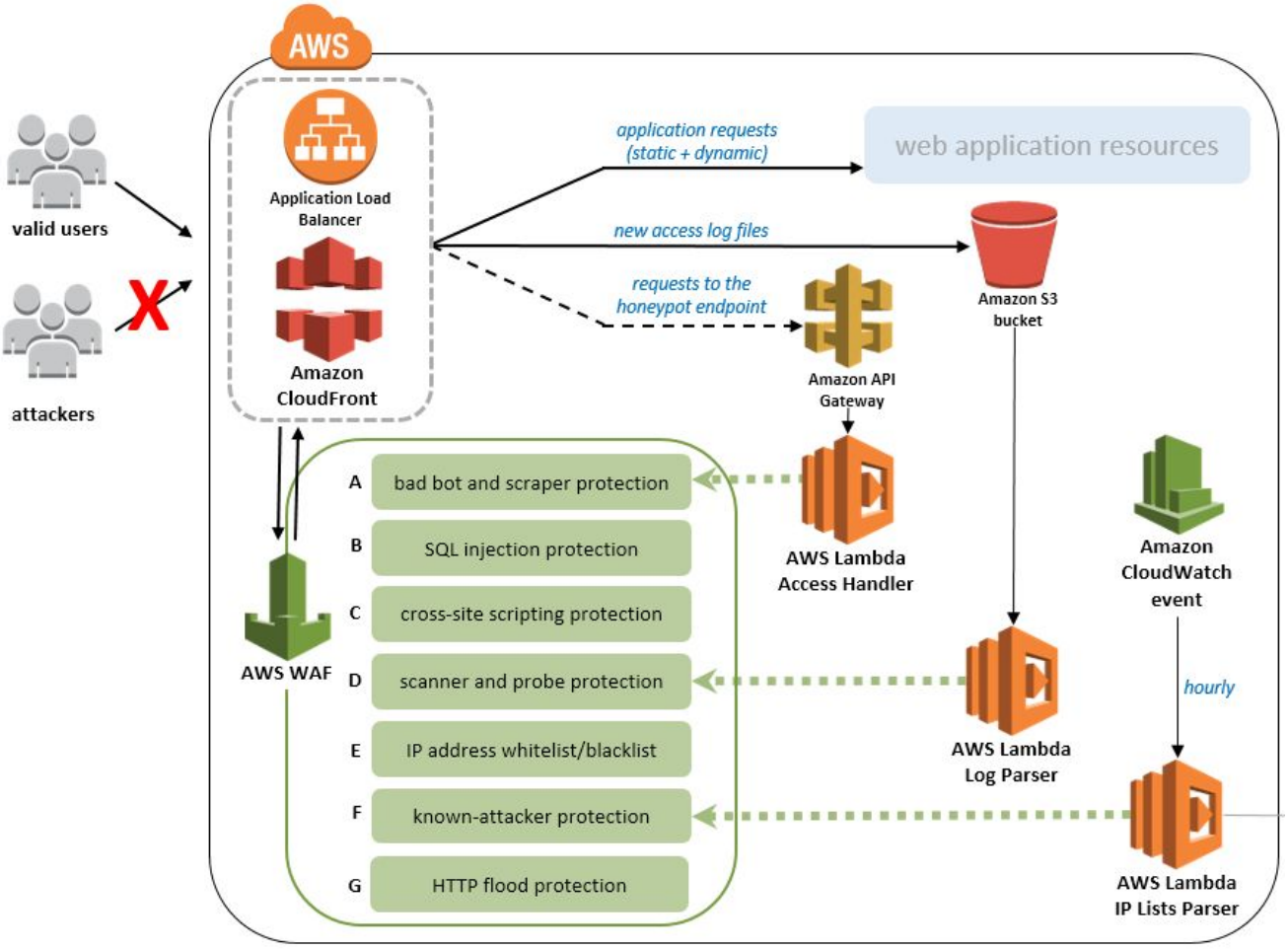
It is mission-critical for AppDrag to maintain availability of services and hosted websites and apps on a 24/7/365 basis. To achieve this, AppDrag's

infrastructure is fault tolerant across multiple regions in the world. An automated system provides constant real-time monitoring to prevent any service interruption of service for customers.

iii. Security

Security is the single greatest priority for most web developers and website users today. AppDrag has multiple security layers which are summarized below.

- **AppDrag leverages AWS's security infrastructure** (CloudFront, LoadBalancer, WAF, DDOS protection, VPN, IAM, security groups, replication on multiples regions, versioning and Cloudwatch alerts)



- **AppDrag independently deploys a set of additional security measures** (SSL TLS 1.2, firewall protection, request filtering at app level, SQL

injection protection, buffer overflow protection, process isolation and other proprietary techniques).

- **Security tokens** - Every action (from UI or API calls) requires a security token that lasts for a short period of time after login.
- **Encryption** is used throughout for file storage, database and client/server communications.

iv. Performance

After security, performance is a key consideration for web developers. In this section, we benchmark AppDrag's absolute and comparative performance using a variety of standardized criteria.

Two well recognized indicators of performance are Google PageSpeed[1] and Yahoo YSlow[2]. A convenient way to test and compare multiple sites quickly is also provided by GTMETRIX[3].

A comparative assessment of AppDrag's Performance and Optimization assessment carried out with GTMETRIX, when compared to the two largest participants in the Cloud CMS market, Webflow and Duda, showed very favourable results as shown below[4].

	https://appdrag.com/ Mon, Nov 20, 2017 @ 8:29 AM Vancouver, Canada Chrome (Desktop) 58.0.3029.96	https://webflow.com/ Mon, Nov 20, 2017 @ 8:31 AM Vancouver, Canada Chrome (Desktop) 58.0.3029.96	https://www.duda.co/ Mon, Nov 20, 2017 @ 8:42 AM Vancouver, Canada Chrome (Desktop) 58.0.3029.96
PageSpeed Grade	A (92%)	D (60%) -32%	D (62%) -30%
YSlow Grade	A (93%)	E (53%) -40%	D (60%) -33%
Fully Loaded time	2.2s	4.6s +2.4s	2.8s +0.6s
Total page size	2.43MB	4.26MB +1.83MB	1.34MB -1.09MB
Total # of requests	54	134 +80	135 +81

[1] https://developers.google.com/speed/pagespeed/
[2] http://yslow.org/
[3] https://gtmetrix.com
[4] Full report: https://gtmetrix.com/compare/jCir2i7j/KNlfjWfQ/G1bwOx2f

Another useful metric for performance evaluation is Time to first byte[5] around the world. AppDrag's performance against that criterion was tested using KeyCDN Performance Test[6].

The results of the test, for AppDrag and, subsequently, for Webflow, are reproduced in the following tables.

Location	Status	Cache	ETag	DNS	Connect	TLS	TTFB
New York	200	na	na	4.237 ms	1.424 ms	17.671 ms	22.347 ms
Miami	200	na	na	62.763 ms	0.618 ms	25.076 ms	33.528 ms
Dallas	200	na	na	6.765 ms	1.114 ms	26.878 ms	242.448 ms
San Francisco	200	na	na	63.746 ms	3.994 ms	24.866 ms	33.62 ms
Seattle	200	na	na	6.606 ms	0.477 ms	16.973 ms	19.564 ms
Toronto	200	na	na	64.692 ms	1.124 ms	22.317 ms	46.981 ms
Frankfurt	200	na	na	6.726 ms	13.091 ms	40.542 ms	68.401 ms
London	200	na	na	31.714 ms	1.702 ms	18.362 ms	23.56 ms
Paris	200	na	na	6.455 ms	22.899 ms	59.608 ms	106.884 ms
Amsterdam	200	na	na	31.394 ms	1.271 ms	15.899 ms	19.584 ms
Sao Paulo	200	na	na	6.075 ms	9.273 ms	31.714 ms	52.372 ms
Singapore	200	na	na	15.645 ms	2.029 ms	30.413 ms	35.504 ms
Sydney	200	na	na	6.212 ms	0.816 ms	14.144 ms	16.949 ms
Tokyo	200	na	na	7.678 ms	7.974 ms	31.195 ms	49.057 ms

Time to first byte for **AppDrag.com - Average: 55ms**

[5] https://en.wikipedia.org/wiki/Time_to_first_byte
[6] https://tools.keycdn.com/performance

Location	Status	Cache	ETag	DNS	Connect	TLS	TTFB
New York	200	na	na	4.252 ms	8.075 ms	27.912 ms	45.77 ms
Miami	200	na	na	30.693 ms	25.836 ms	61.788 ms	115.91 ms
Dallas	200	na	na	7.343 ms	31.077 ms	75.564 ms	139.891 ms
San Francisco	200	na	na	128.071 ms	73.37 ms	159.884 ms	307.496 ms
Seattle	200	na	na	6.603 ms	67.763 ms	143.697 ms	280.193 ms
Toronto	200	na	na	31.34 ms	29.687 ms	77.391 ms	137.862 ms
Frankfurt	200	na	na	6.771 ms	97.671 ms	210.828 ms	410.749 ms
London	200	na	na	32.019 ms	77.591 ms	168.342 ms	325 ms
Paris	200	na	na	6.452 ms	103.556 ms	217.668 ms	425.928 ms
Amsterdam	200	na	na	15.508 ms	88.442 ms	189.848 ms	368.331 ms
Sao Paulo	200	na	na	6.142 ms	121.253 ms	251.192 ms	495.775 ms
Singapore	200	na	na	15.35 ms	247.023 ms	510.667 ms	1.01 s
Sydney	200	na	na	6.104 ms	218.134 ms	446.631 ms	884.62 ms
Tokyo	200	na	na	7.66 ms	171.708 ms	355.576 ms	701.152 ms

Time to first byte for **Webflow.com - Average: 402ms**

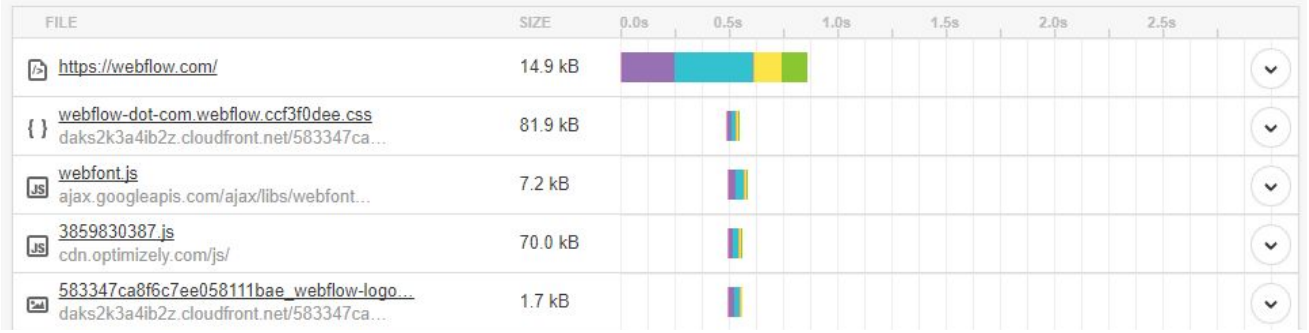
A third performance indicator is the Network Waterfall[7] which evaluates page rendering time. As with previous tests, the Network Waterfall shows a very substantial outperformance for AppDrag compared to other leading services.

This benchmarking shows that the following times are required to render 90% of a page:

- AppDrag: **0.1s**
- Webflow: **0.8s**
- Duda: **0.9s**

*Network Waterfall for **AppDrag.com***

[7] https://developers.google.com/web/tools/chrome-devtools/network-performance/reference



*Network Waterfall for **Webflow.com***

*Network Waterfall for **Duda.co***

b. Dynamic Page Processor

i. High speed page processor

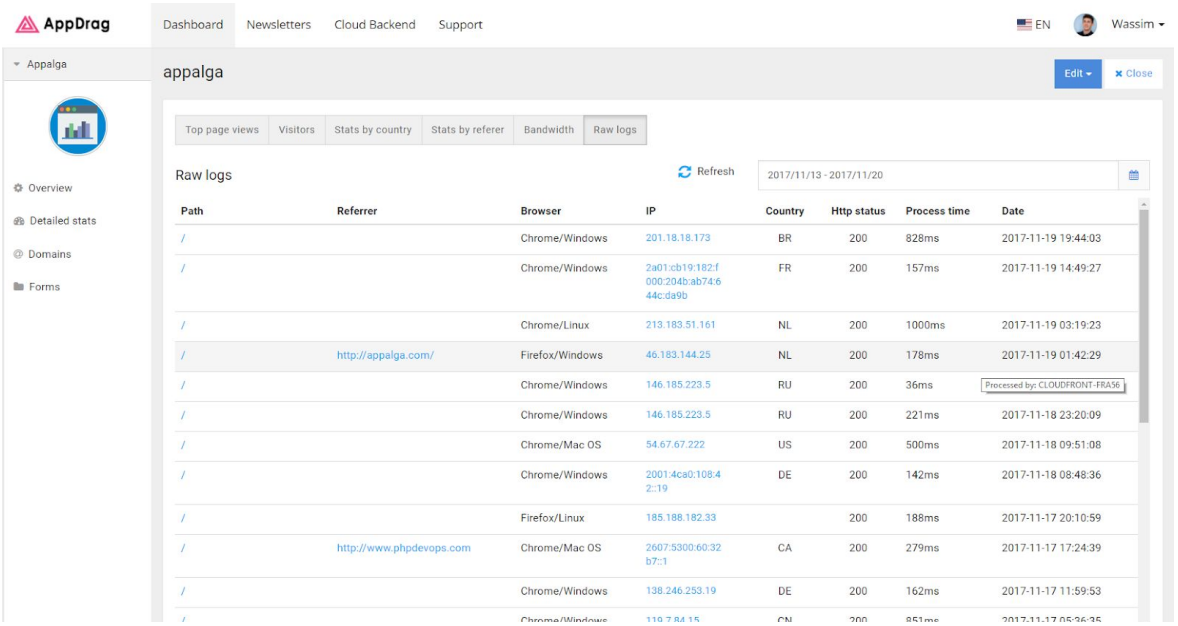
Dynamic page processor is the entry point when browsing an AppDrag website, where all the dynamic operations are done. AppDrag's code is efficient and optimized to compute and deliver the webpage's content, on average, in less than **200ms** for a "cold" query and less than **50ms** for a cached query.

ii. Integrated Cache system

A cache system at node level allows AppDrag to avoid 95% of queries to other parts of the system. In addition, pages generated are cached for 30 seconds to be able to offer nearly instant performance even if a website is under attack (DDoS) or experiencing a severe traffic spike.

iii. Real Time Log

Every action on a website is logged by AppDrag. From a website dashboard the log can be checked in real time. Standardized analytics provided include top page viewed, device type, by country, by referrer and bandwidth usage.



Raw logs from AppDrag Project Overview Statistics

4. Cloud Backend

AppDrag's Cloud Backend is a scalable & affordable solution to create backends easily. **Cloud Backend = Cloud DB + API Builder.**

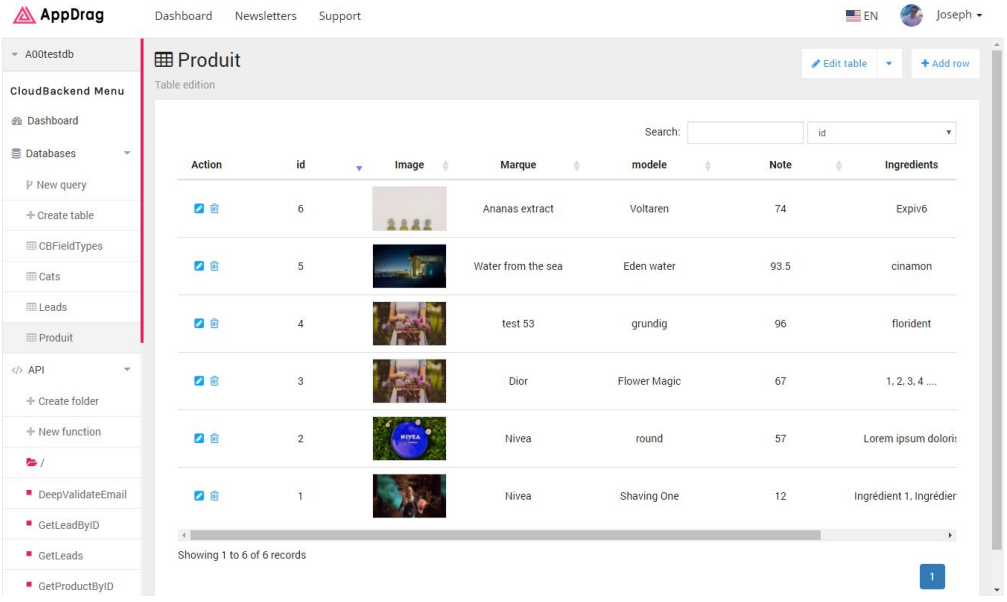
Cloud DB

API Builder

It's core proposition is to enable users to create cloud-hosted backends instantly and to provide maintenance-free, highly secure, high availability and scalable backends.

a. Cloud DB

AppDrag CloudDB is a cloud hosted database solution that is fully compatible with MySQL. AppDrag provides the solution with a zero maintenance requirement and virtually unlimited scalability. It incorporates a Visual Interface that enables users to process actions from simple to highly advanced.



Preview of Cloud Backend Database Editor

How does it work?
AppDrag CloudDB is based on a cluster of Amazon Aurora[8] servers. This allows AppDrag to affordably provide very high performance levels without compromising security or availability.

On top of this infrastructure AppDrag offers an intuitive and powerful UI to create tables and edit table content. It provides an option to import existing content in CSV format or restore a whole MySQL database from a backup.

For developers AppDrag also provides a direct API to execute complex SQL Queries (create tables, add index, mass updates, etc.)

b. Cloud Functions / API Builder

AppDrag API Builder is a **serverless compute service** that lets people create & run code without provisioning or managing servers.

AppDrag supports 5 coding languages:

- **NodeJS** (Online code edition and package manager included);
- **C#**;
- **Python** (Online code edition included);
- **JAVA**;
- **SQL** (Online code edition included);

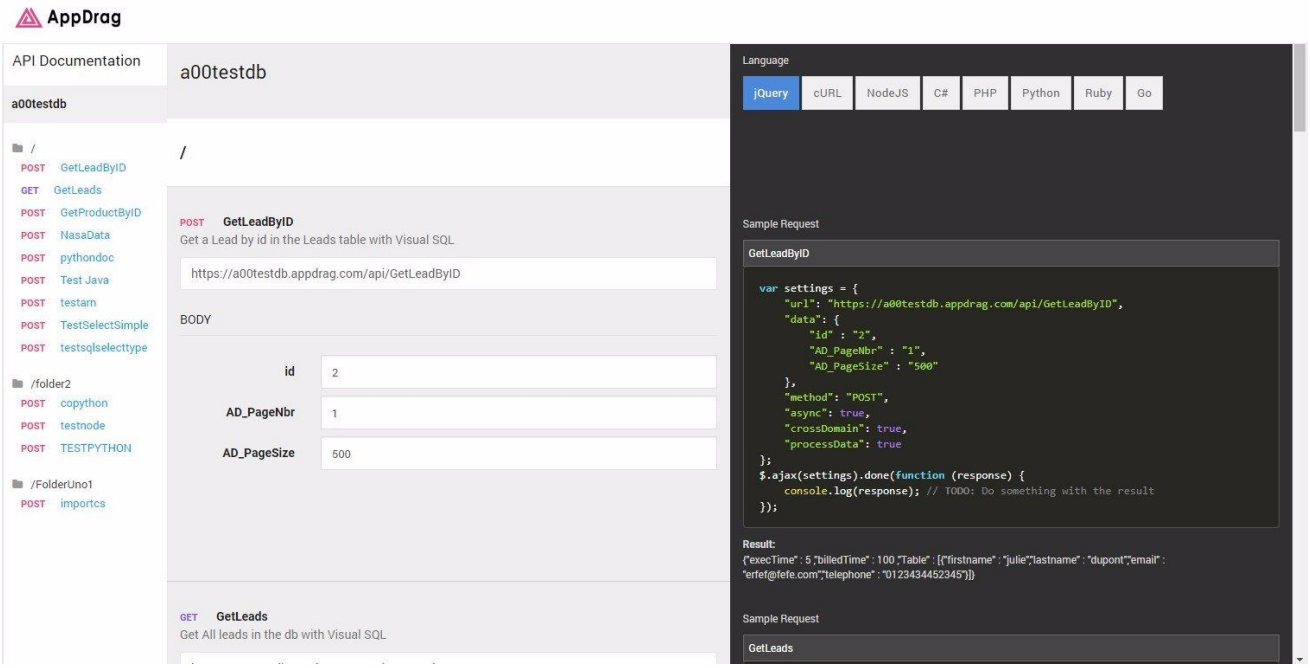
Support for further languages including PHP, Perl and Go will be added shortly.

AppDrag also provides a Visual SQL interface to create operations on Cloud DB without a requirement to write any code. Examples include:

- SELECT;
- INSERT;
- UPDATE;
- DELETE.

[8] http://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/Welcome.html

Users can call API functions directly in any programing language with POST and GET requests or decide to schedule them for daily, weekly or monthly recurrence with the tasks scheduler.



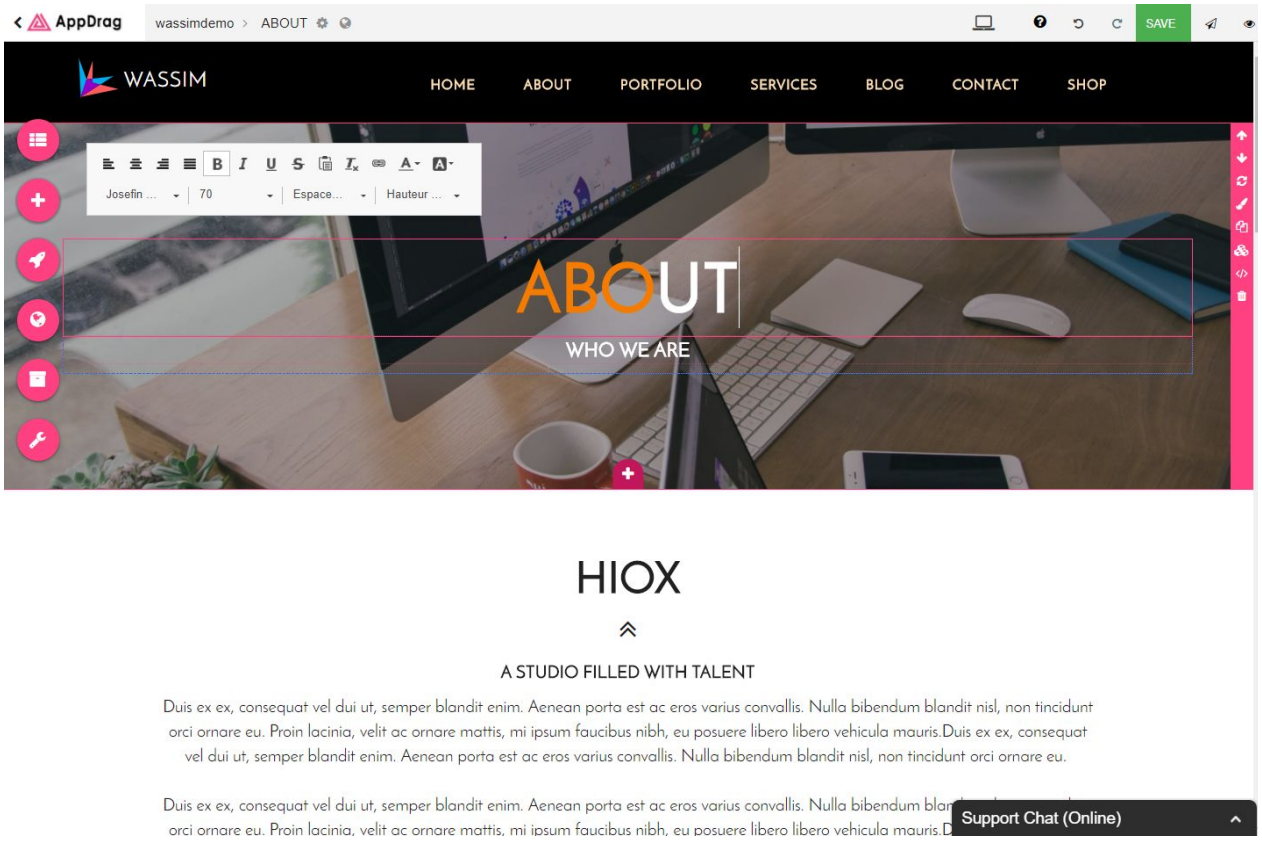
Auto Generated API Documentation with samples for 8 languages

How does it work?

AppDrag API Builder is based on AWS Lambda. AppDrag abstracts the AWS Lambda complexity and provides an online editor & package manager. This provides an easy & effective way to create API functions very quickly and to share them with a collaboration team.

5. PageBuilder

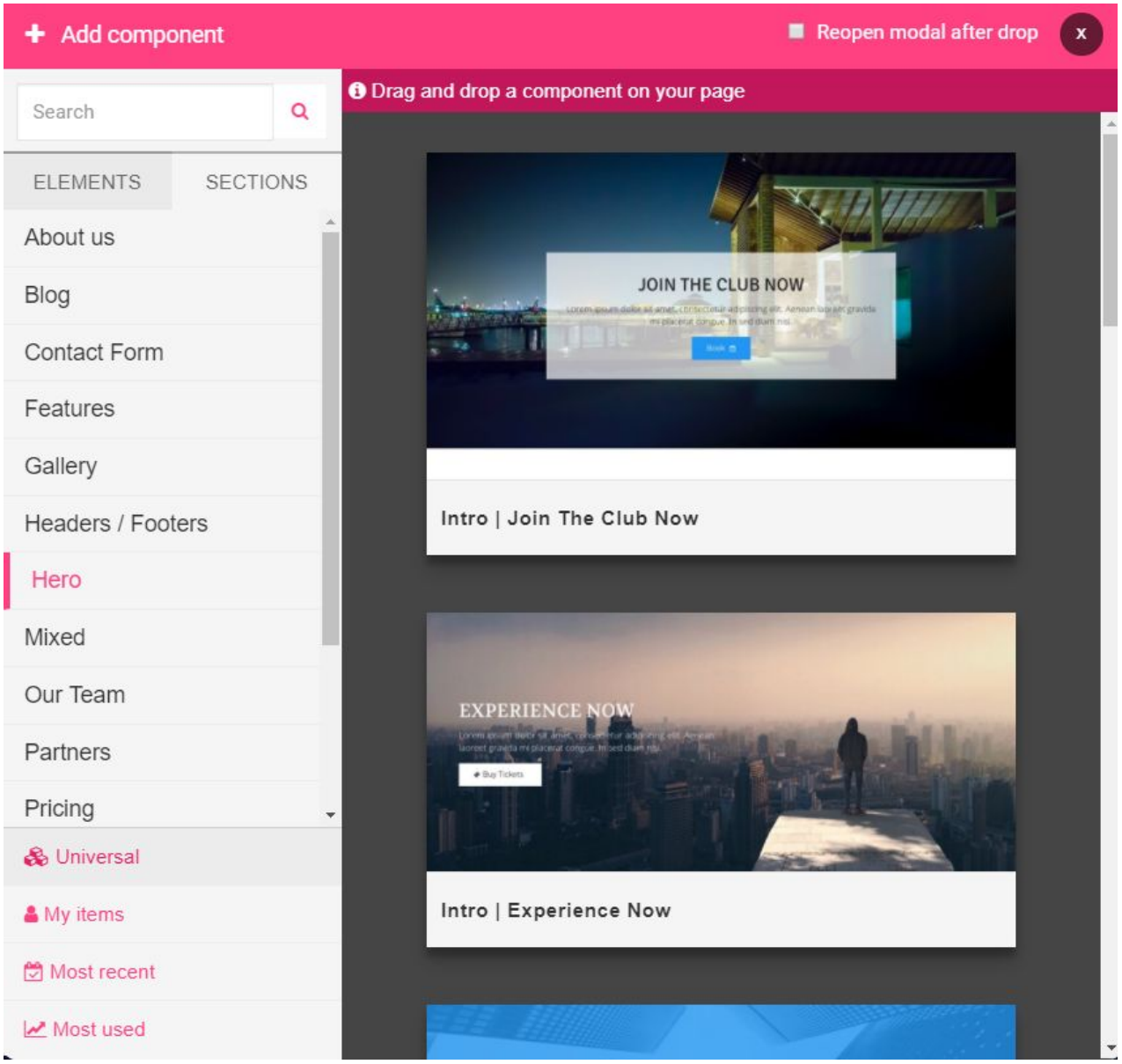
PageBuilder is the main component of AppDrag's frontend engine. It provides a fast and powerful tool for the easy creation of high-end, responsive websites. Its integrated functionality includes search optimization, blog manager and ecommerce.



Editing text on AppDrag PageBuilder

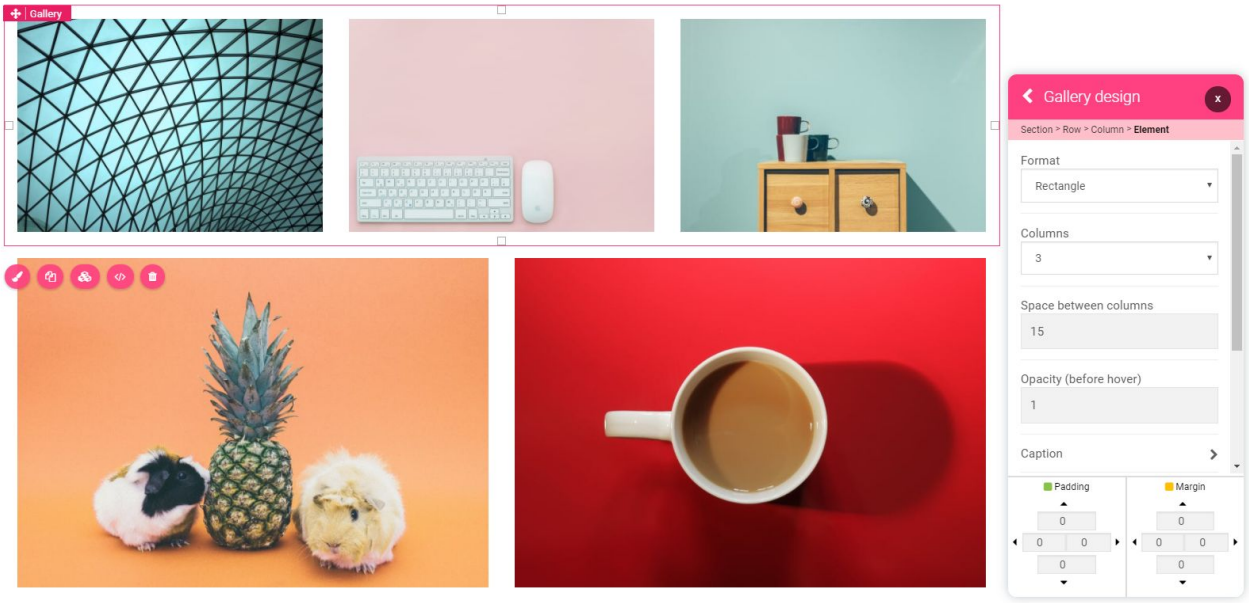
a. Page Editor

Page Editor provides an easy-to-use drag and drop interface with more than 1,000 pre-made layouts and components. Those components are classified into categories and can be built both by the AppDrag team and AppDrag PageBuilder's users. The solution is provided with an embedded "MarketPlace" allowing users to submit components and make them available to other AppDrag users either free or for a charge.

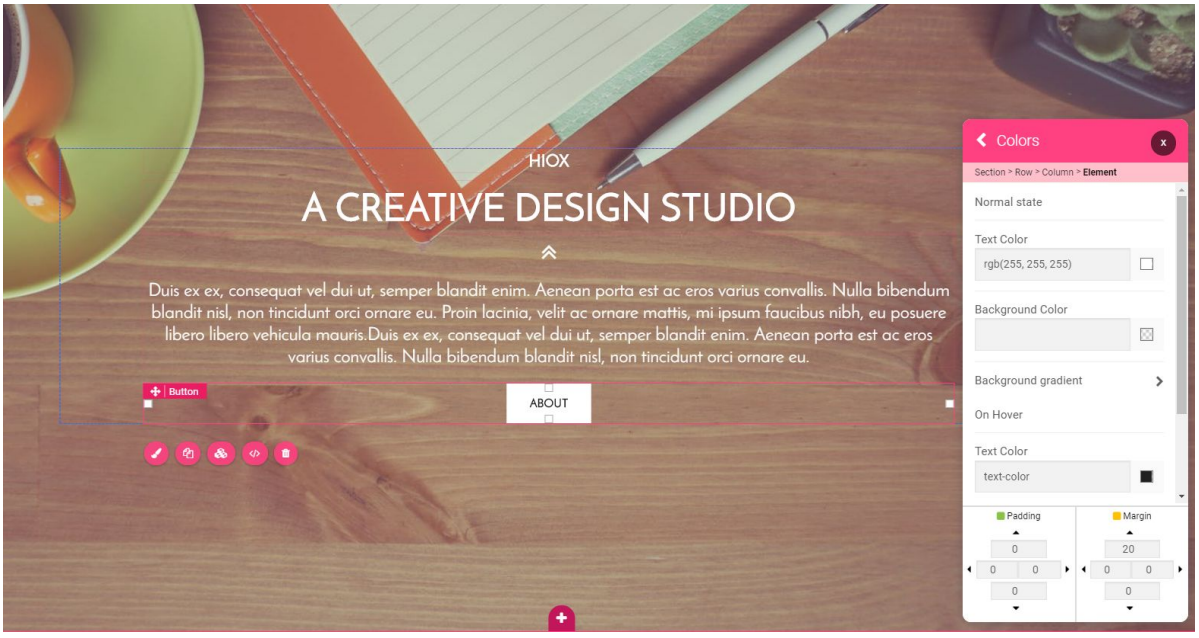


Add component Modal from the Page Editor

Web pages use a **bootstrap** grid system to render perfectly on desktop, tablet and mobile devices. Pages comprise sections, rows, columns and elements that can all be easily moved and sized. Everything is customizable and benefits from a custom brush feature according to element type.



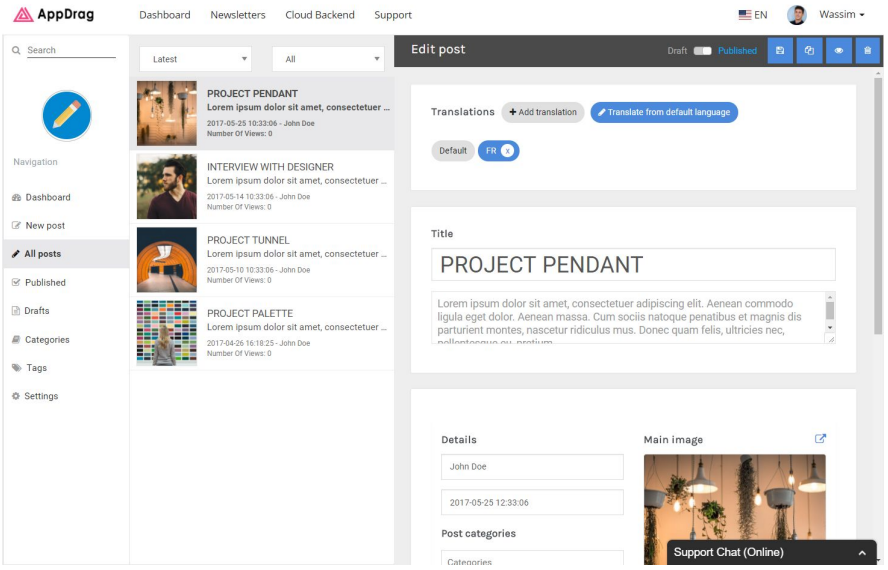
Editing the design of a gallery



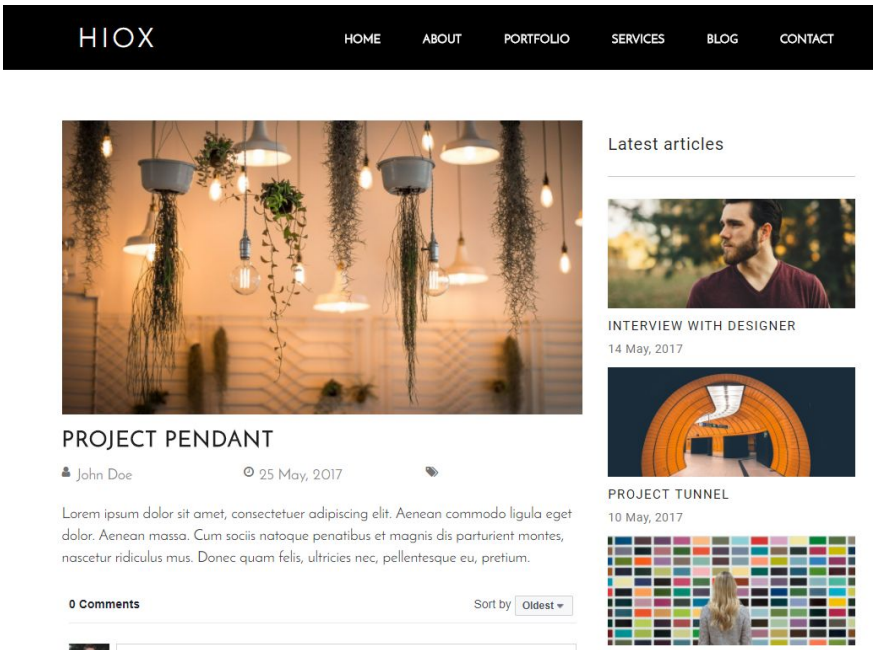
Choosing button colors

b. Blog

AppDrag comes with an easy to use blog system. The blog article list and detail page can be completely customized with PageBuilder. Articles are written / edited and monitored directly from the Blog manager. Each article appears as a new page on search engines with the article title/description for a better visibility of the website. Sitemap is automatically submitted for quicker search engine indexation.



Writing a blog article

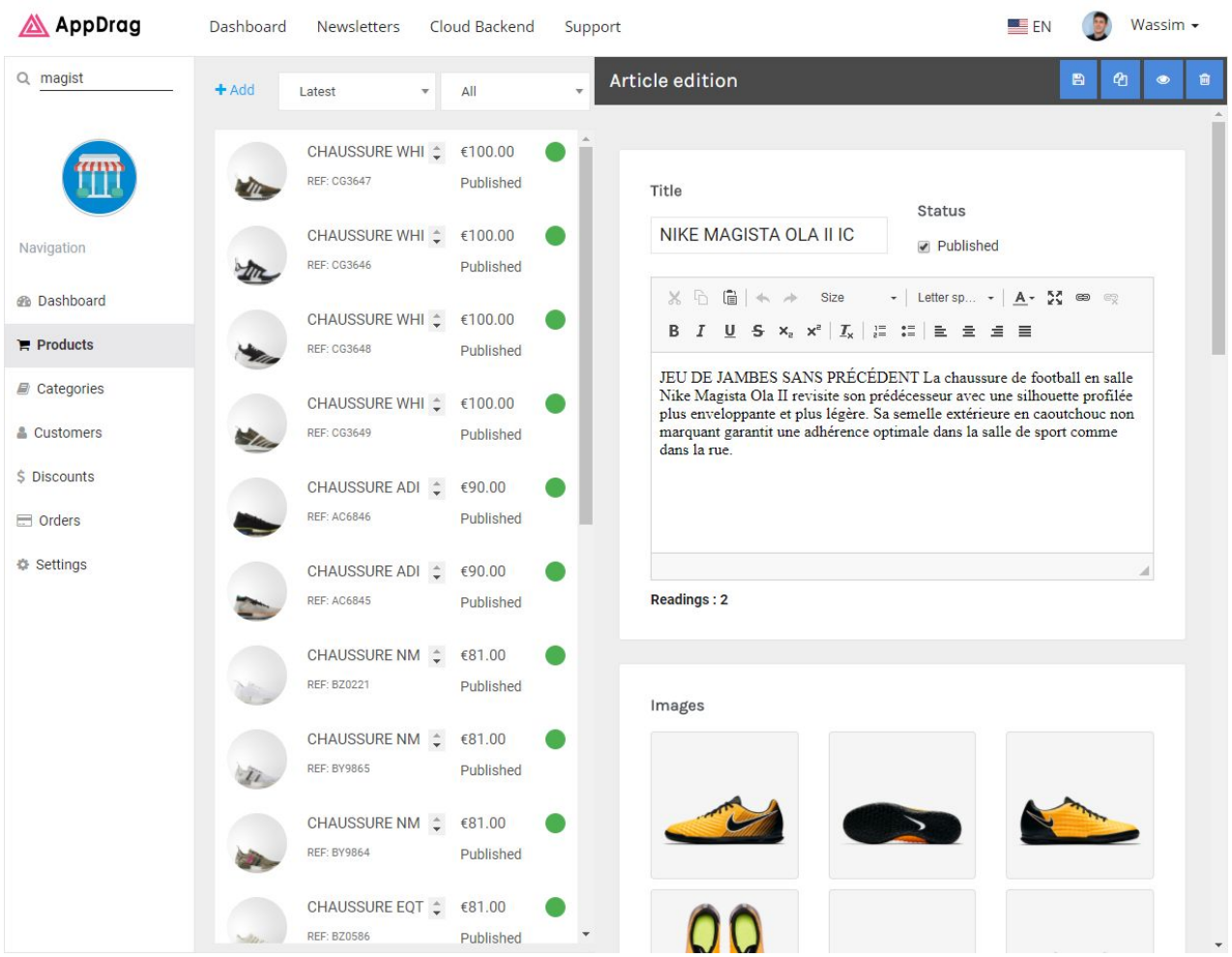


Preview of a blog article

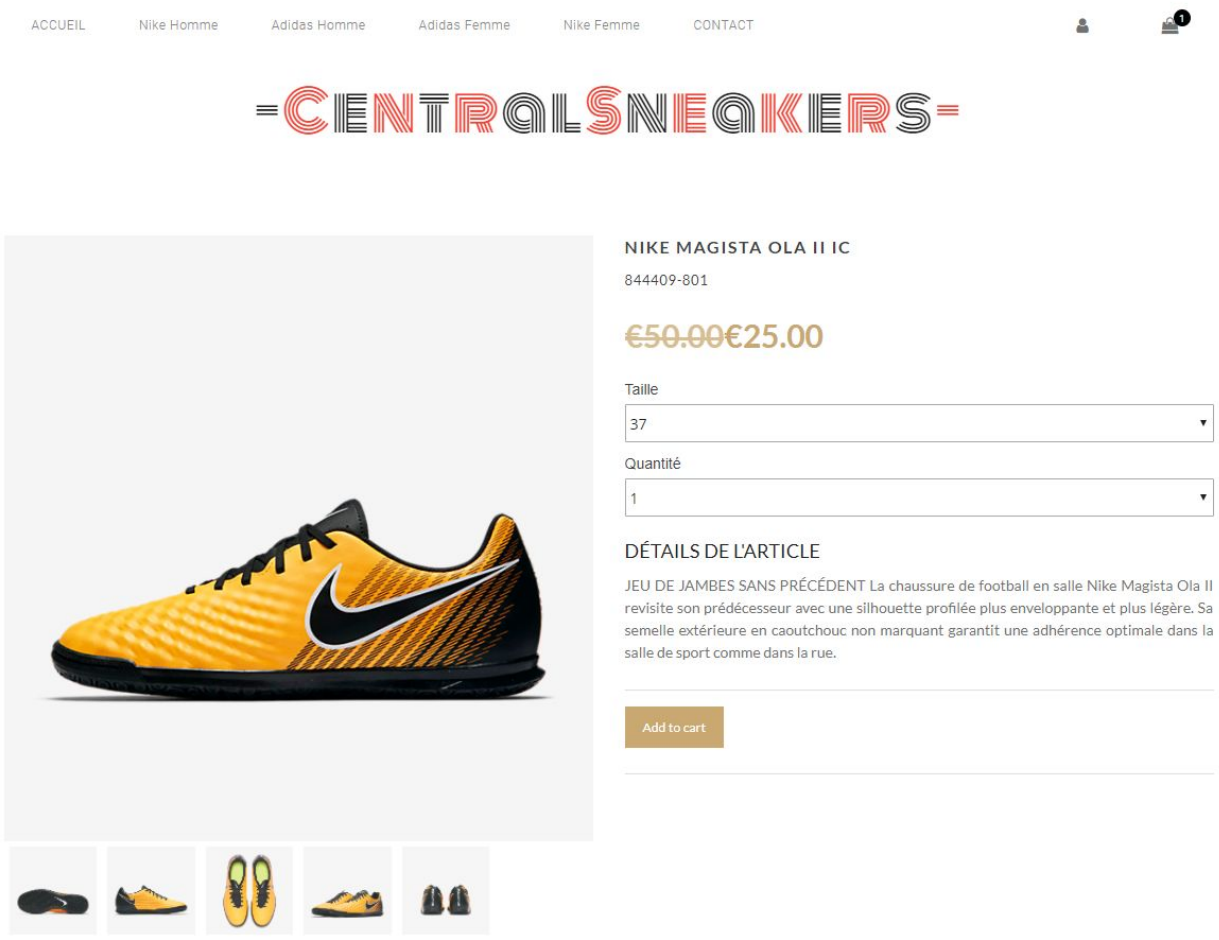
c. Shop

AppDrag comes with an easy to use shop system. Shop is designed inside the PageBuilder and products are created / edited / imported inside the Shop manager. Each product appears as a new page on search engine with the title of the product for better visibility of the website.

AppDrag handles complex use cases such as product variations with different prices / references, tax configuration and shipping fees with multiple shipping providers and prices, discount codes, etc.



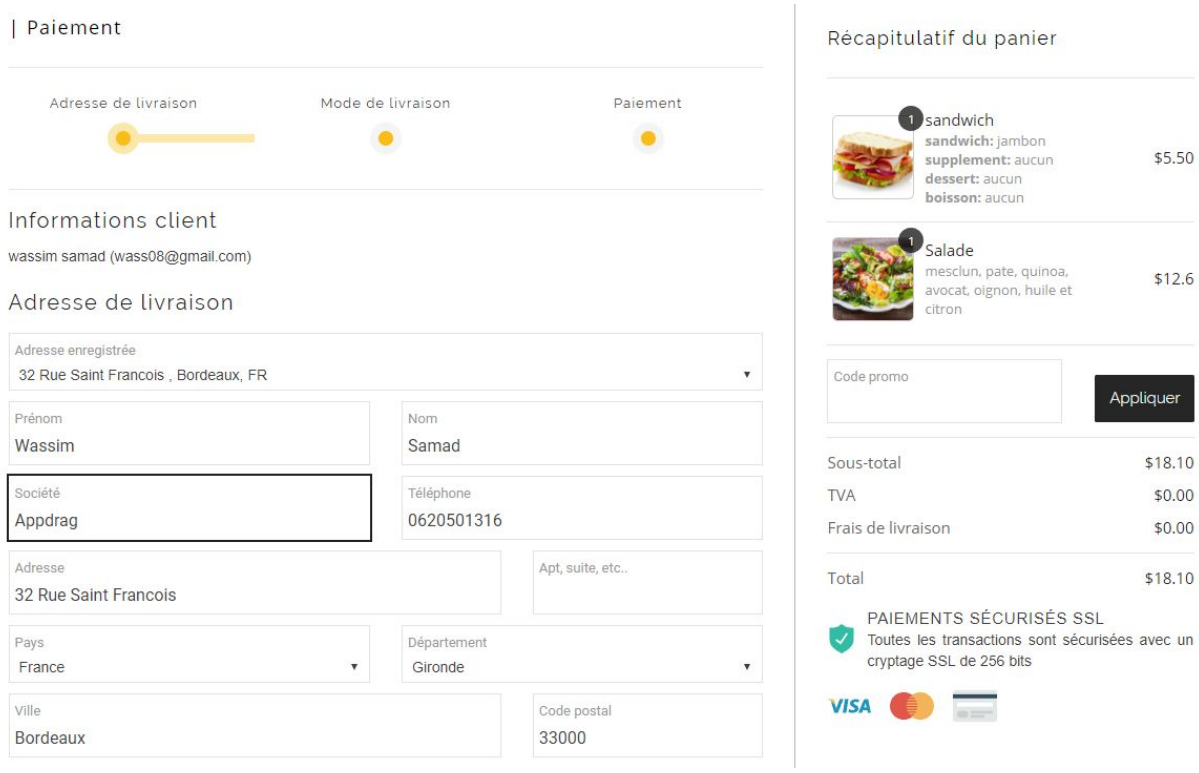
Creating a new shop product



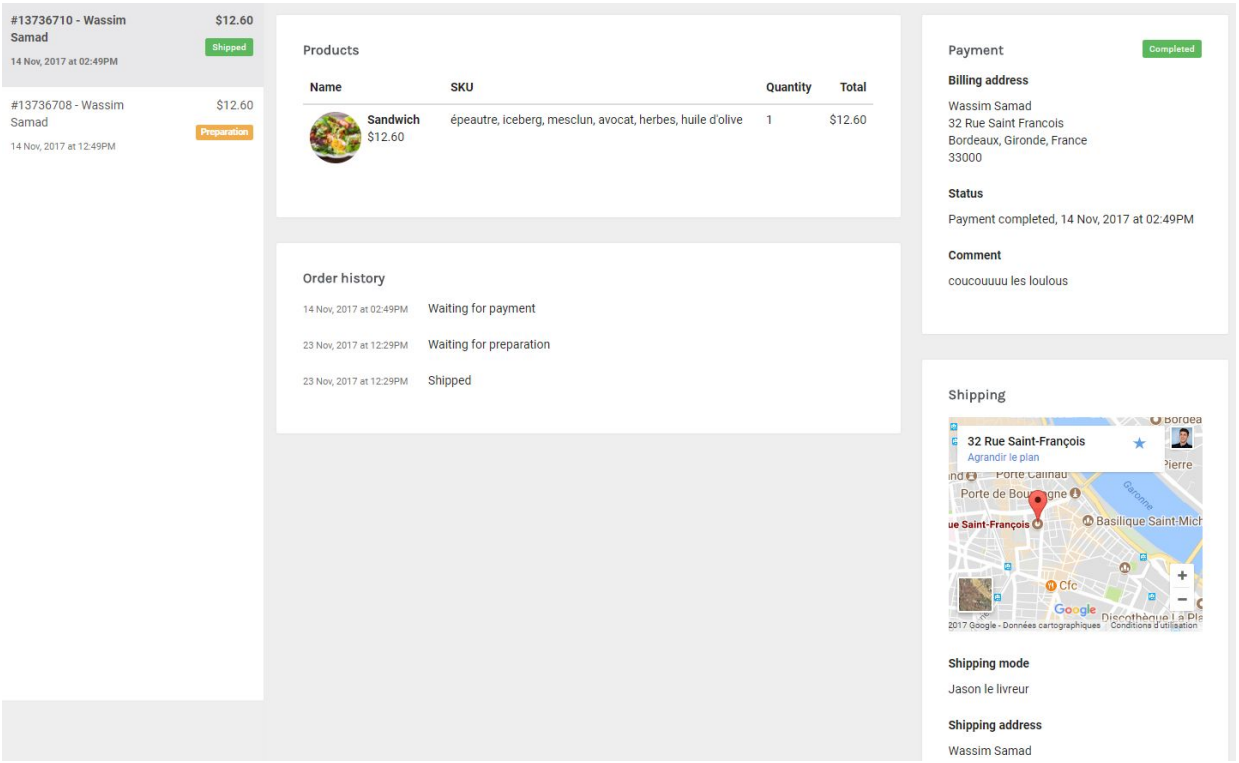
Preview of the newly created shop product

The shopping process from the cart to the user account and checkout are included by default and ready to work after the setup of payment providers including PayPal, Stripe and Offline Payment.

Unlike certain other services such as Shopify, AppDrag does not charge transactions fees.



User processing a checkout



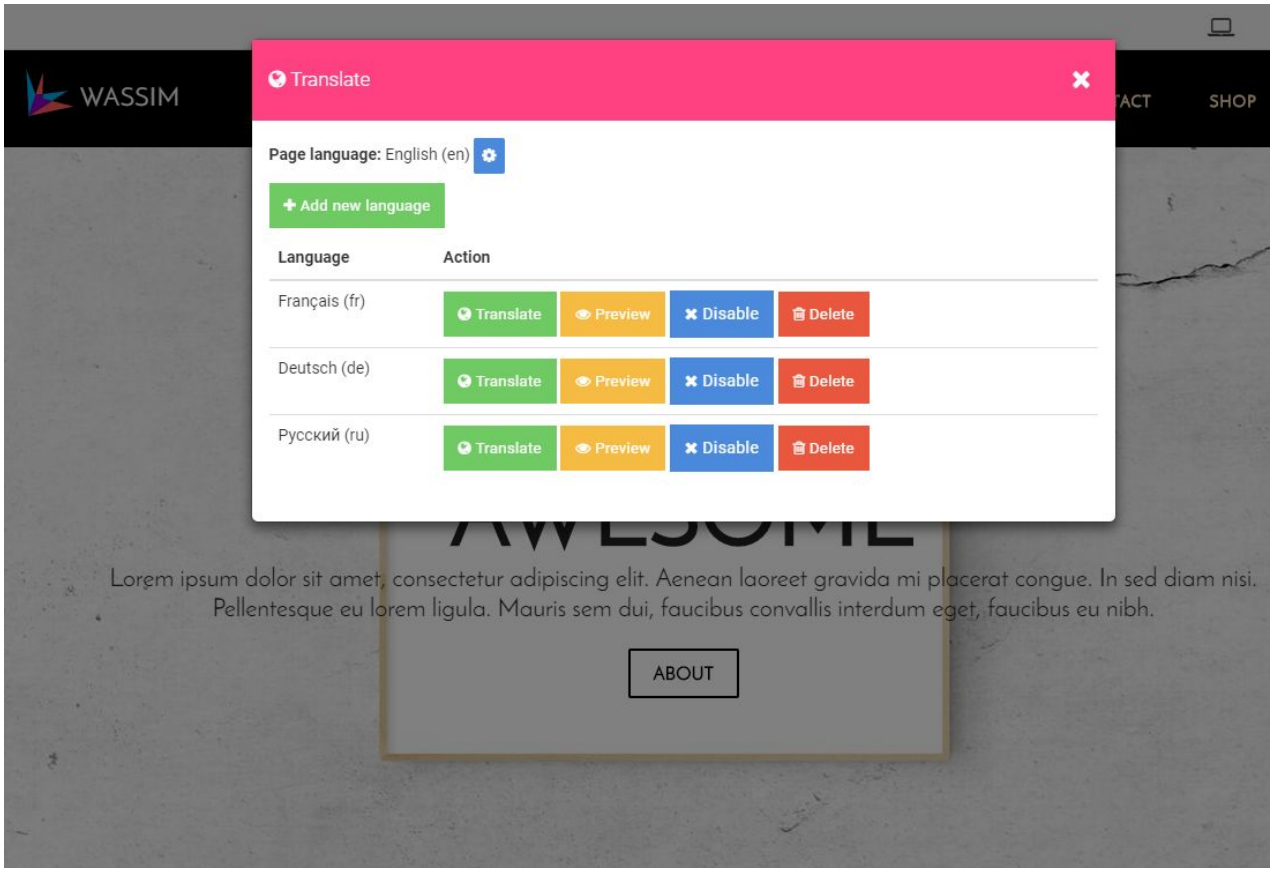
Shop owner receives the order in his shop backoffice

d. In-page translation system

AppDrag makes it easy to create a multilingual website with its integrated translation manager which currently supports 105 languages.

Unlike many other solutions, AppDrag's in-page translation system is not based on duplicating the website. Rather, all translations are saved inside the page in each text element. When the page is rendered, DynamicPageProcessor returns the page in the correct language to the visitor.

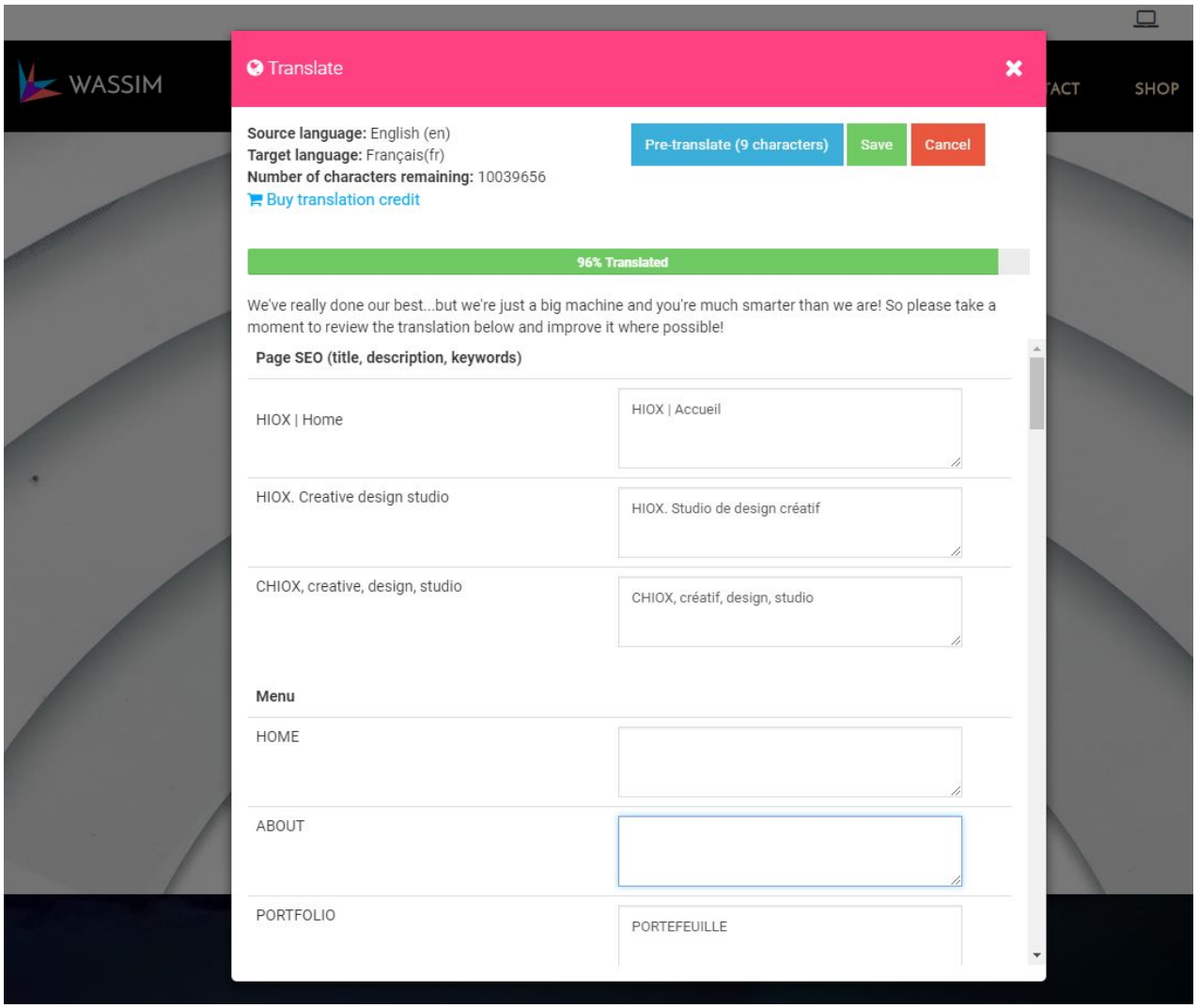
This greatly benefits website owners and developers as modifications only need to be done in one language rather than in all languages the site is available in.



Translation modal to select in which languages the page will be translated.

To enhance the translation solution, AppDrag provides a “Pre-Translate” button that will attempts translation of a page using the Google Translate API.

Users can refine the translation after a first pass of automatic translation.



Translating the content of a page from English to French

Users can drop a language selector anywhere on the page. The selector can be configured to be an image, a text, an icon or anything and can open a language selection menu or switch directly to a target language.

6. Source code edition

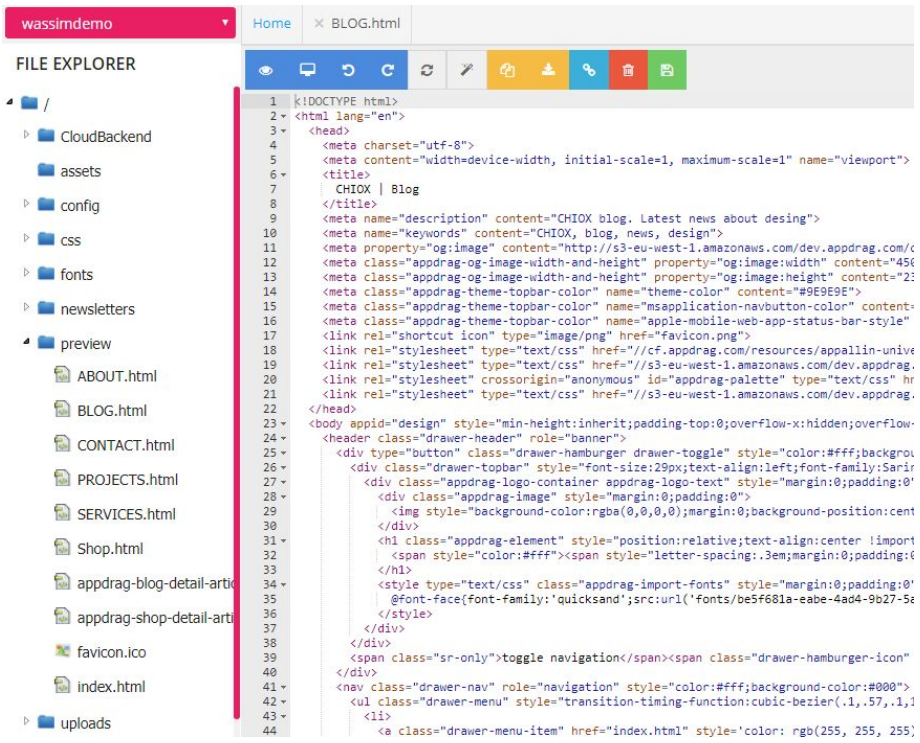
a. PageBuilder

Website Pages created with AppDrag contain high quality HTML Code. They are easily readable and editable. This button will appear on every kind of element, column, row and section; from there you can modify the source code if needed or just watch the code structure.

Code edition of a text element

b. Advanced

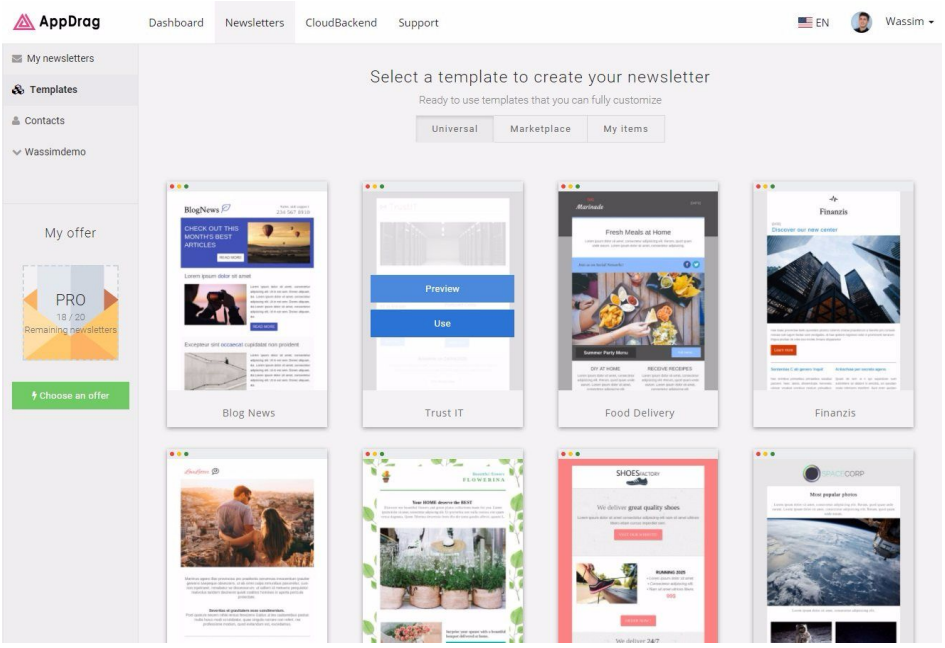
You can edit and create your website without the PageBuilder with the Advanced feature. This tool provide you a folder/resources manager on the left to manage / update / download / move your file and folders.



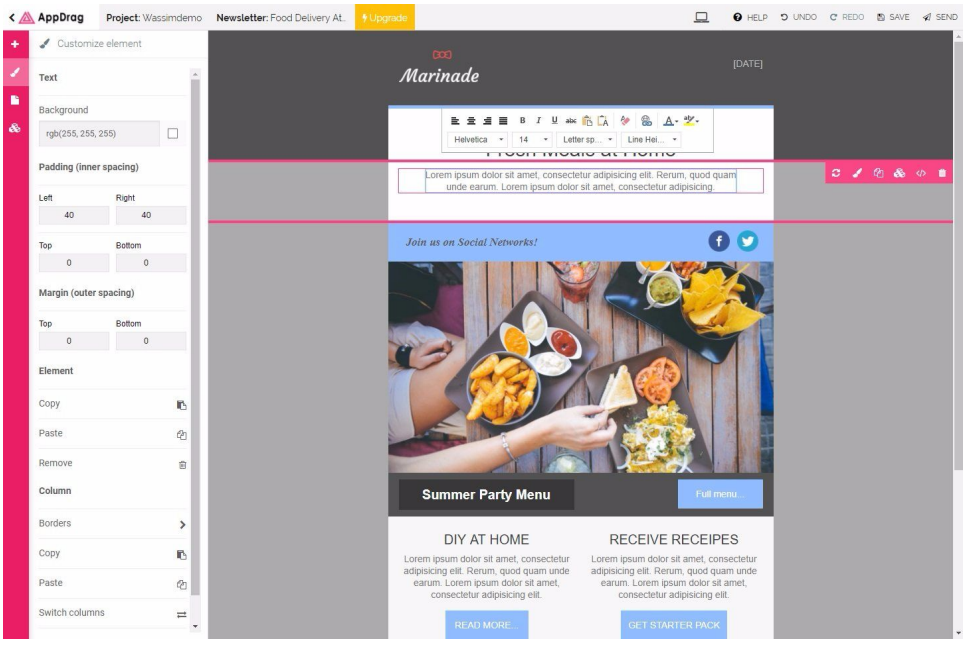
On the right is the online code editor with tabs for every file opened. Every save is pushed directly on your website. You can use this feature in addition to the PageBuilder for some adjustments of your website or as is as you would do in a more traditional web creation way.

7.Email Marketing

AppDrag Newsletters enables users to send visually impactful responsive HTML newsletters to recipients without a requirement for coding. It has the power of the PageBuilder customized to deal with email constraints.



Beautiful email templates are provided as starting point



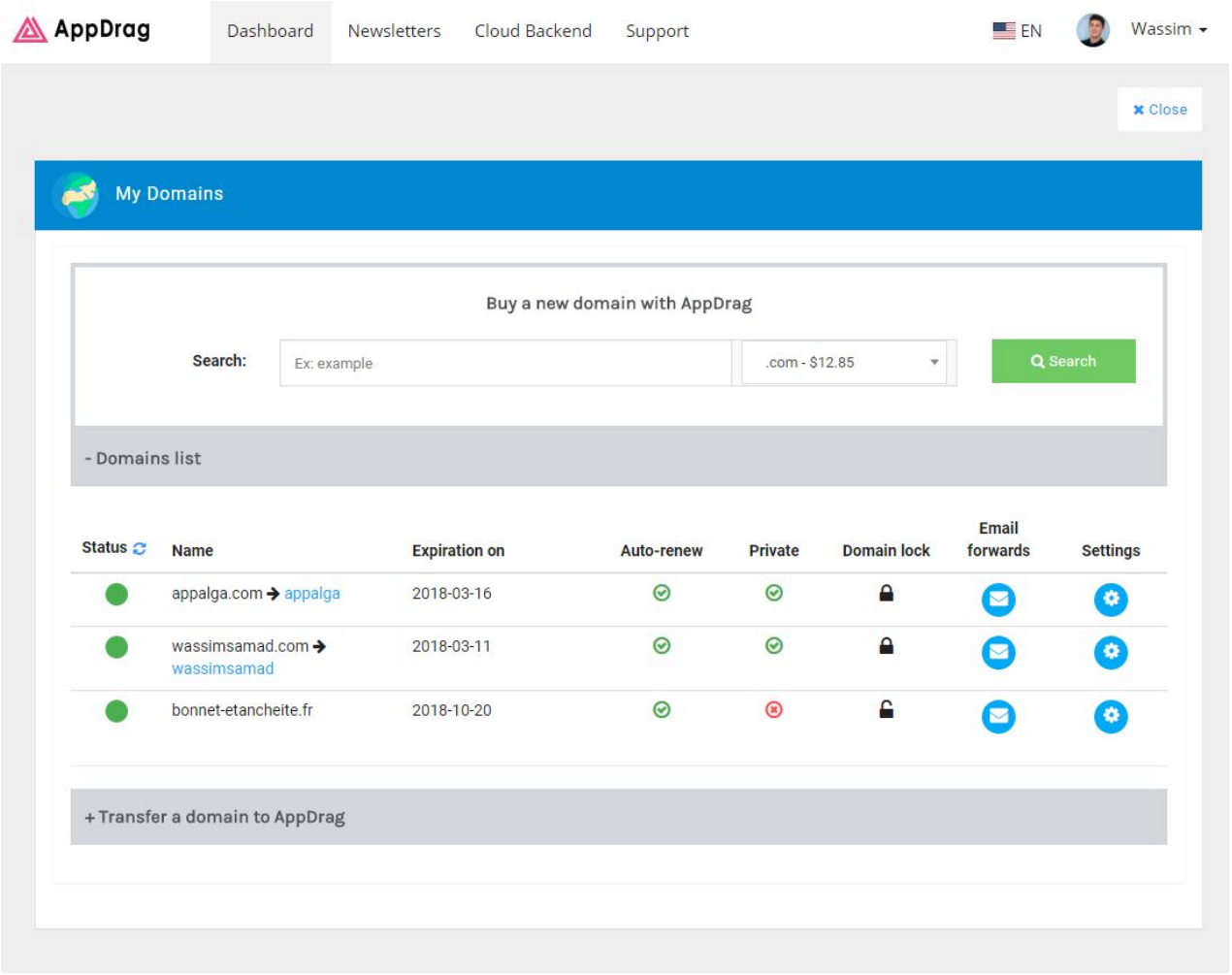
Editing the newsletter content in few clicks

Each email sent to each contact is logged into the newsletter statistics, enabling the sender to monitor a variety of analytics including delivery, opening, clicks, etc. If the newsletter is unsubscribed, soft / hard bounced or if a complaint is made, this information is also tracked and available.

Stats overview of a newsletter sent to hundreds of contacts

8. Domains / Email / DNS / SSL Certificates

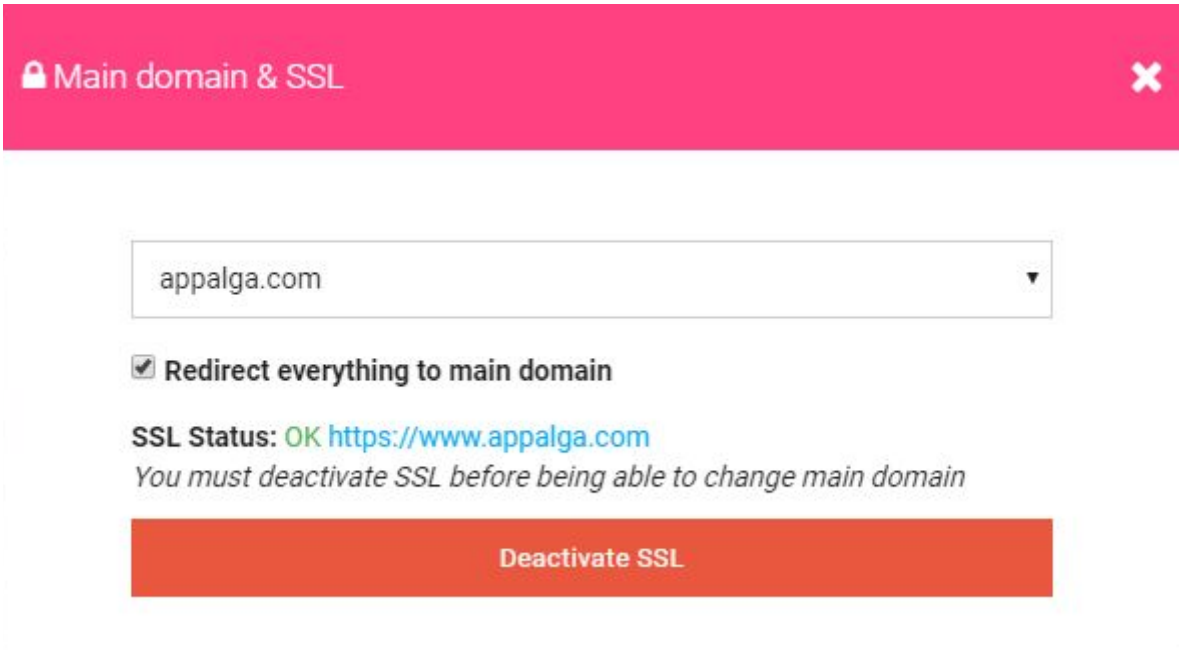
AppDrag website projects come initially as a subdomain of **".appdrag.com"**. Users can buy/transfer and configure their own domain name with the AppDrag Dashboard. Users can choose among 458 domain extensions including (.com, .info, .biz, .me, .net, .org, .pro, etc.) and a lot of national ones (.be, .ca, .co.uk, .de, .es, .fr, .in, .it, .nl, .ru, .us, etc.).



Domain overview

Once purchased, the domain name will automatically be assigned to the AppDrag project without any additional configuration. Email forwards can be created with the purchased domain name. SSL can be added for free on a custom domain name; by a simple click an SSL certificate will be generated

and deployed for the desired domain. All AppDrag subdomains have SSL enabled by default for free.



SSL enabled on a company website

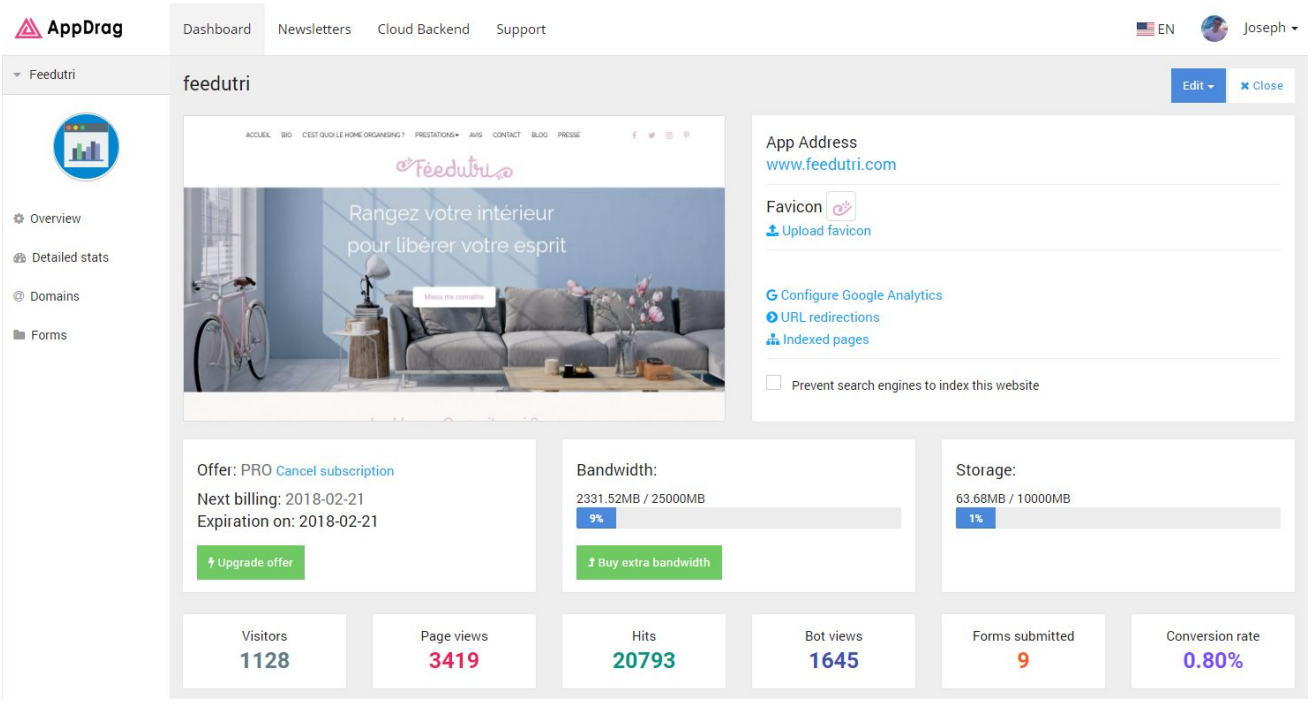
Domain names can also be transferred from another registrar to centralize everything into the user's AppDrag account.

9. Analytics & Dashboards

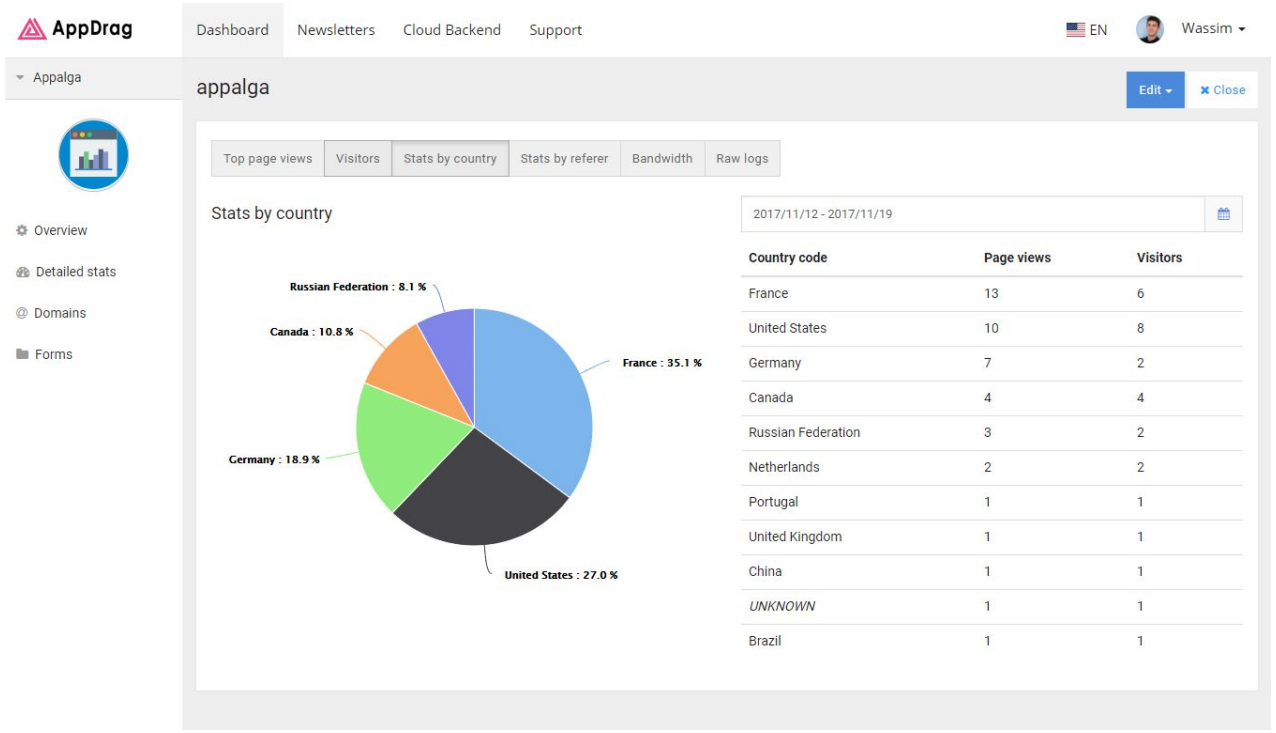
AppDrag provides a comprehensive analytics and project management dashboard. This provides summary data on:

- Number of visitors, Page views, Hits, Bot views;
- Forms submitted, Conversion Rate;
- Bandwidth / Storage used;
- Analytics: Top page views, visitors, stats by country / referer, bandwidth, raw logs.

The site owner can drill down from the summary data in obtain deep insights into user behavior.



Project overview



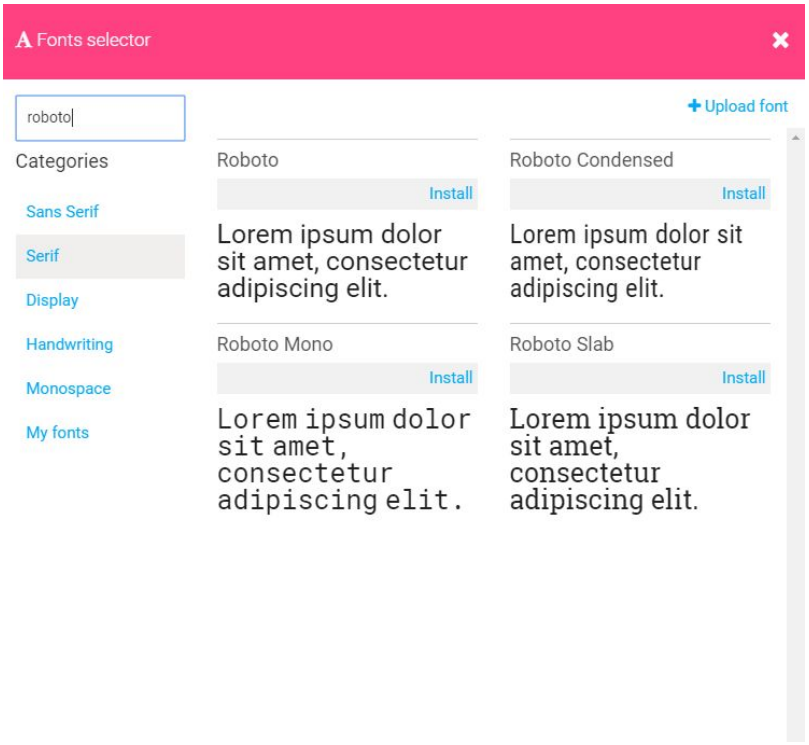
Determine where your users are coming from

Users also have the option to easily configure their own Google Analytics account for an AppDrag project.

10. Tools (Font convertor, Photo Gallery, SVG editor)

AppDrag provides several special tools to enhance the design process for web designers.

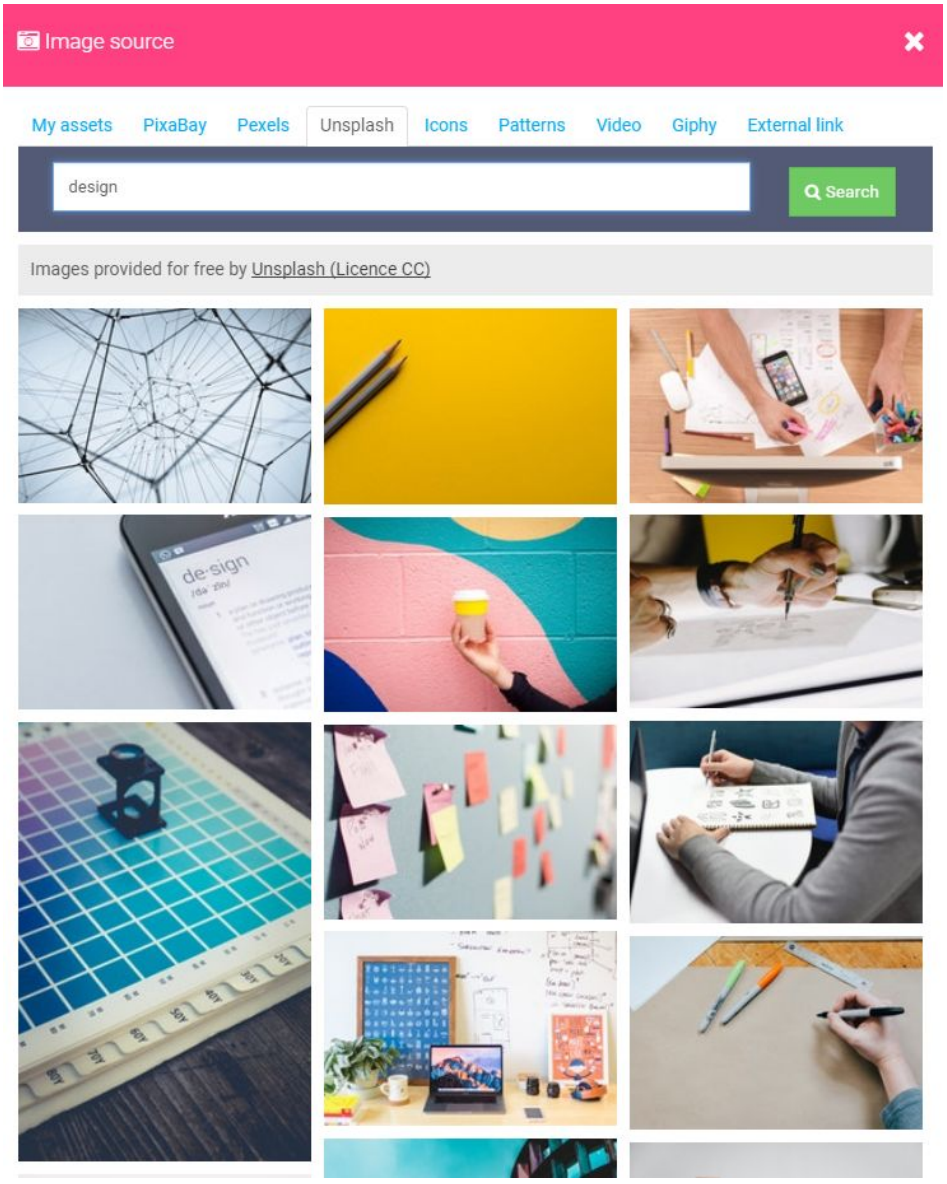
Font Manager / Convertor:
The font manager let the user choose between hundreds of Google fonts to install / uninstall into the website. The user can also upload their own font directly - .ttf, .woff, or .woff2 will automatically be converted to the two other formats to work on all browsers.



Free Photo Gallery:

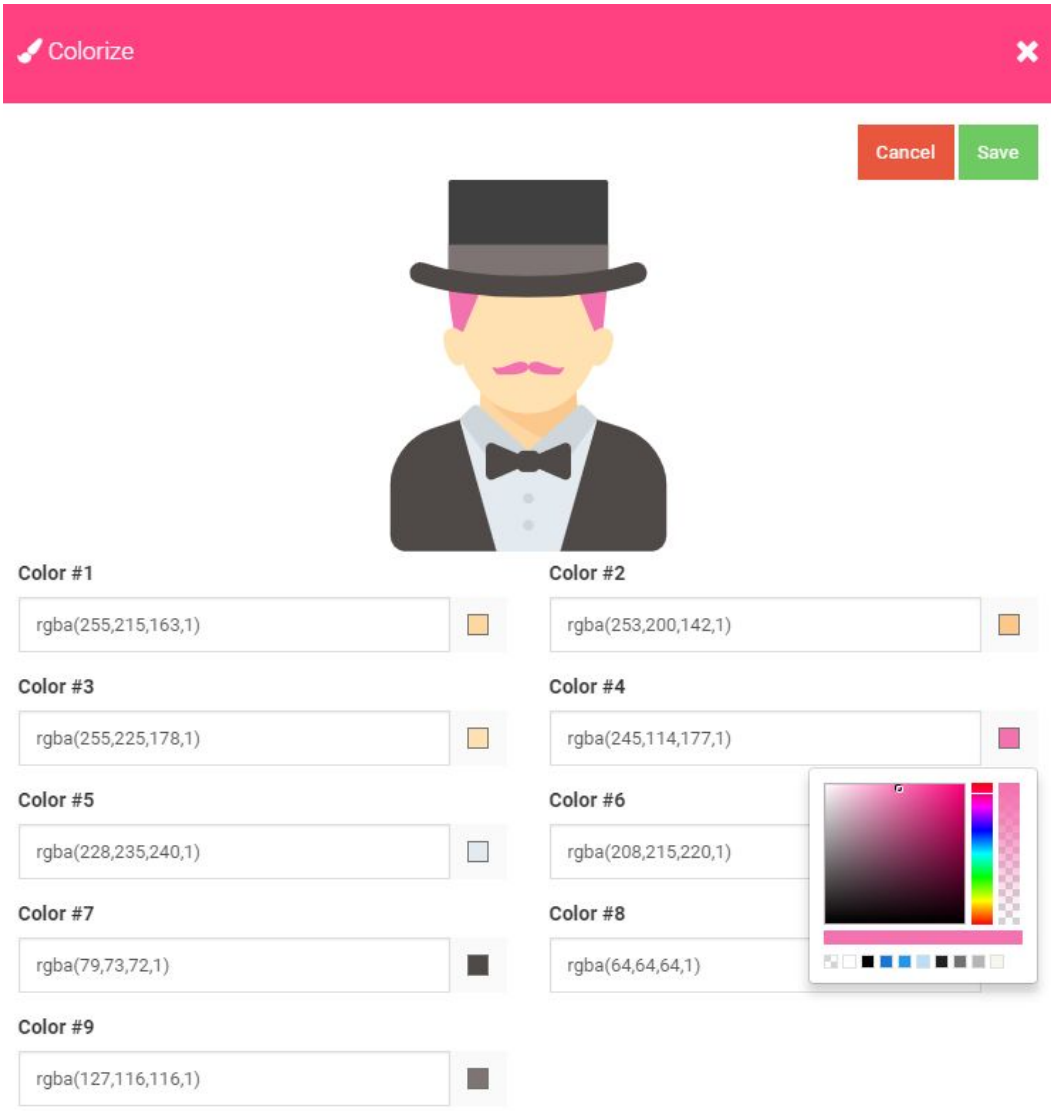
AppDrag provide thousands of royalty free photos for commercial use from different providers (PixaBay / Pexels / Unsplash) and also :

- Useful Icons / Logos;
- Patterns for design backgrounds;
- Videos to give life to sections;
- Giphy, to add a touch of humor in some websites / newsletters.



Choosing between thousands of image to create an astonishing website

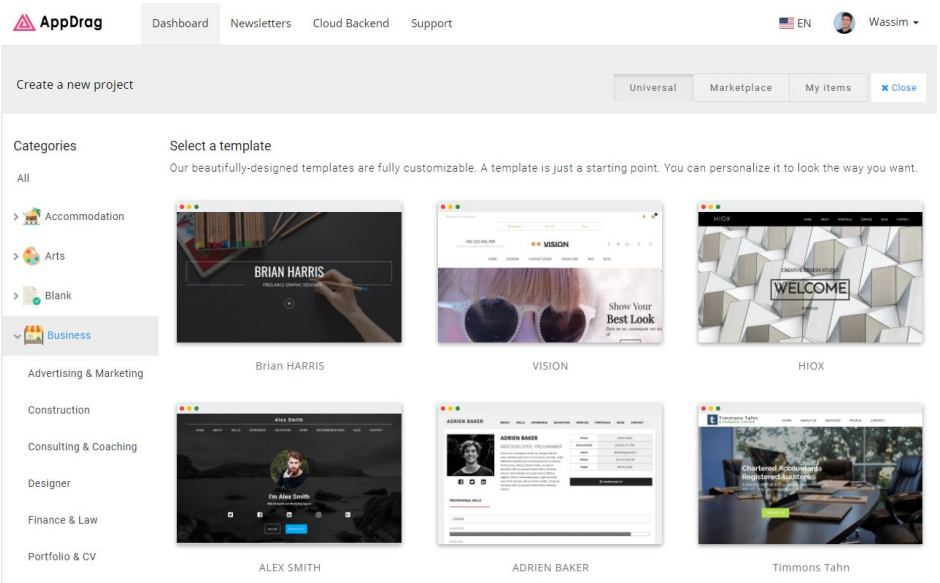
SVG Editor:
Logos and Icons from AppDrag Free Gallery are SVG and can be extensively customized.



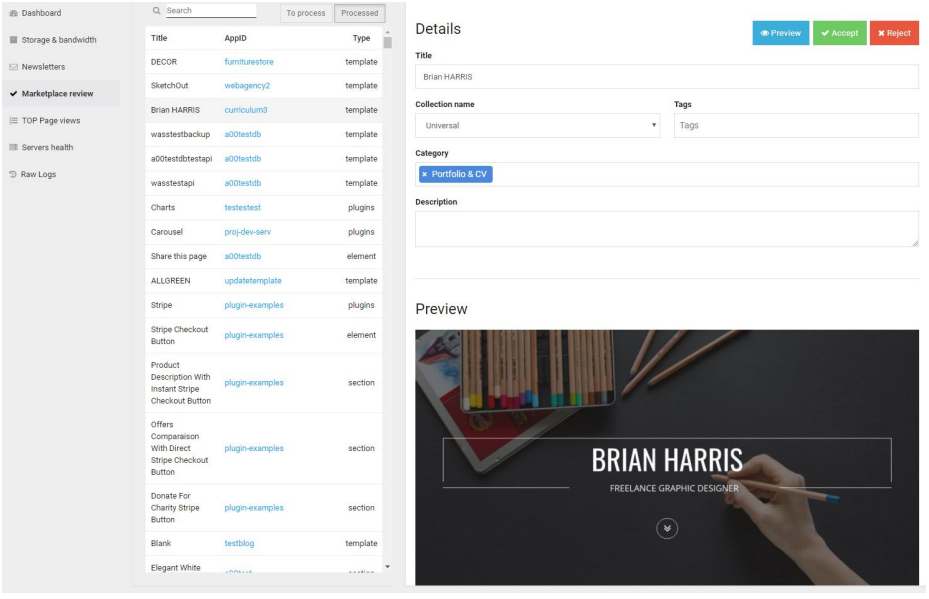
Colorizing the hair color of a gentleman icon

11. Marketplace

The AppDrag ecosystem relies on the fact that every user can contribute and share its content with others, ranging from full website / newsletter templates to specific elements and sections to complex plugins to achieve very specific tasks. Contributors will be able to set a price on their own marketplace components and generate revenue from them.



Website templates



Moderation team ensures the quality of published content and that every component meet AppDrag guidelines

12. Competitors comparison

This comparison evaluates AppDrag across all key considerations and parameters for web professionals.

	Traditional CMS	Cloud CMS for individuals	Cloud CMS for web professionals	
Main players	WordPress, Joomla, Drupal	Wix, Squarespace, Weebly	Webflow, Dudamobile	AppDrag
Development time/cost	Poor	Good	Good	Excellent
Scalability	Poor	Poor	Excellent	Excellent
Security	Poor	Excellent	Excellent	Excellent
Performance	Poor	Average	Average	Excellent
Source code access	Excellent	Squarespace only	Average	Excellent
Supports localization	Not available	Not available	Not available	Excellent
White-label options	Average	Not available	Not available	Excellent
Email Marketing	Not available	Wix only	Not available	Excellent
Domain names	Not available	Average	Not available	Excellent
Cloud Database	Not available	Not available	Not available	Excellent
Cloud API	Not available	Not available	Not available	Excellent

13. Conclusion

AppDrag is the optimal solution for website and web applications development. Everything needed to create professional websites is available. The focus has been on allowing users to reach results they couldn't achieve before without coding, and doing it much faster. Server configuration and management is eliminated. Time-consuming coding tasks can be done visually in just a few clicks.

While basic users will quickly understand AppDrag's intuitive interface, this does not take away from the fact that it is an extremely powerful tool for sophisticated web developers, providing endless design features and direct source code access. For this reason, web agencies are quickly embracing AppDrag as an alternative to WordPress and shifting all development and production work to the AppDrag platform.

Cloud Backend is unquestionably a disruptive platform with Cloud Database and Cloud API Builder. A backend deployed without setup or complex configuration, the ability to create custom dynamic pages within the project backend and to manage data make it possible to fulfill any project requirements.

Finally, benchmarking against the small number of potential competitors shows vastly superior results for AppDrag.