

Automated Privacy Compliance Auditing as a Service



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For my wife and son.

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Executive Summary

Consent management platform (CMP) vendors provide services that enable companies to inform their users about the types of information their website will collect and how it will be used. The consent management process will be automated by the vendor and make it easier for companies to meet the standards set by data and privacy compliance regulations (Zawadziński & Wlosik, 2020). The process of ensuring a website's integration with a CMP results in being compliant with regulations, however, is often manual and subject to human error.

At Cereus, we aim to become the leader in cutting-edge privacy compliance auditing tools by allowing our customers to request audits on-demand, or by linking our services into any continuous integration system. This ensures that a website, and any new features, meet the compliance standards customers have defined within our systems before deployments reach their users. Should an audit fail to meet compliance standards, stakeholders will be notified via email with an audit summary.

The auditor incorporates our belief that compliance involves more than the concept of "cookie consent." Our audits augment cookie consent by providing insights into the requests made on the website. This involves the requested resource, response status code, the type, size of the information exchanged, stack/callee trace, and whether or not the request met compliance expectations. With this information, our customers will be able to quickly identify where the compliance infringement originated and respond accordingly.

We serve the privacy management software market, which is expected to grow from an estimated US \$808.8 million (2019) to a total of \$6.1 billion by 2026 (QY Research, 2020). We offer flexible subscriptions for any sized organization that's looking for privacy compliance auditing. It may, however, be difficult to market smaller companies that our services are worth mitigating the risk of being fined. Our primary focus is medium to large-sized organizations managing multiple websites.

Our niche within the privacy management software market emphasizes privacy compliance auditing. In our Competitive Analysis, we identified some industry leaders in the privacy management software and auditing markets. We speculate that our automated services will reduce the need for manual privacy compliance audits, but not necessarily replace them. The primary competition will come from privacy management software vendors with the technical capabilities to implement similar auditing utilities in addition to their CMP. Our greatest advantage against mature privacy software vendors will be our artificial intelligence capabilities and time present in the privacy auditing market.

Under the assumption of an initial investment of \$8,500.00 from the founders to begin operations, a marketing budget of \$250.00 per month for advertisements, and a 1% conversion rate; our operations have the potential to be profitable within 6 months without any external funding. Less than favorable marketing conditions will delay our company's break-even date an additional 6 months. Even with unfavorable marketing conditions, our company will have a positive cash balance with no liabilities.

General Company Description

Cereus is a software-as-a-service company offering privacy compliance auditing tools and solutions for businesses that collect customer information through their websites. We augment privacy consent and risk management practices by auditing websites per the business rules our customers define within our systems. We'll automatically conduct audits based on their release schedule or on-demand.

Unique Value Proposition

We believe that consent involves more than just cookies on our customer's websites. It involves all information they share with their vendors and partners including network traffic. We will actively scan, monitor, and analyze our customer's websites to identify compliance infringements per their business rules.

Mission Statement

It's our mission to remove privacy barriers between companies and their partners and enable them to communicate in an efficient, compliant way.

Vision Statement

We will proactively detect all privacy compliance infringements defined by our clients before they reach their customers.

Values Statement

- Reliability
- Transparency
- Growth

Company Goals and Objectives

Our primary goal is to establish ourselves as a thriving company that leads the privacy industry by providing automated, insightful, audits to ensure that companies and their partners are sharing customer information per their business rules.

Business Philosophy

Some companies spend millions to establish privacy compliance and risk management program. Everyone else gets Cereus.

Industry Overview

The privacy technology industry is a rapidly growing field. In 2020, it is the fastest-growing technology sector that includes the fastest-growing company in the U.S (Hughes, 2020). As more consumers become impacted by massive data breaches in which sensitive, personally-identifying information (PII), is exposed; consumer awareness and the call for data processing regulations are expected to be on the rise.

There are already governmental regulations impacting businesses in the U.S. The Health Insurance Portability and Accountability Act (HIPAA) highly regulates patient information and how it is stored (Centers for Disease Control and Prevention, 2018). The California Privacy Protection Act (CCPA) regulates the selling of user data collected by a business for consumers in the state of California (California Legislature, 2018). The Children's Online Privacy Protection Act (COPPA) imposes requirements on website operators on collecting information from children under the age of 13 years old (FTC, 1993). Lastly, the General Data Protection Regulation (GDPR) gives European Union citizens the right to manage their information any business has collected on them and requires explicit consent before information is collected (Council of the European Union, 2018).

With all these regulations, foreign and domestic, companies that collect information from their customers are relying on the assistance of privacy technologies to operate within the bounds of new regulations and meet consumer privacy expectations (Meehan, 2019). This has attracted massive funding, and, in July of 2019, the fastest-growing company in the U.S., OneTrust, raised \$200 million in a Series A investment. Other privacy software companies, including TrustArc, raised \$70 million Series D, Privitar raised \$40 million series B, and BigID raised \$30 million Series B (Wood, 2019).

In four years since its founding, as of August 2020, OneTrust is valued at \$2.7 billion (Hughes, 2020).

Market Segment Overview

Any business that operates a website and collects data and analytics on their customers is subject to the regulations in the area/jurisdiction in which the customer originates. This also applies to the jurisdiction in which the business operates. Cereus provides auditing for

companies with a single website, to large enterprises with hundreds. It may prove difficult for small businesses with a single website to justify the expense of privacy audits when they are not often the subject of privacy lawsuits (LaNou, 2020). Our primary focus will be medium to large organizations maintaining multiple websites.

Legal Form of Ownership

Cereus will be organized as a small business corporation (S corporation). As an S corporation, we will be allowed to collect funding and pass off any business profits and expenses to its shareholders without the additional taxes applied to C corporations.

Guiding Principles

The "Living Principles for Design" framework (Hamlett, 2020) was applied to outline how Cereus can maintain a sustainable design while achieving our objectives along the following dimensions:

Environment

The direct environmental impact of our company is expected to be minimal. We will provide software-as-a-service (SAAS) and will rely on cloud services to manage our operations. Cloud services, such as Amazon Web Services (AWS), are composed of large computer networks in which infrastructure is shared with other AWS customers (Amazon, 2020b). Our physical hardware is limited to the machines required to manage services running on the cloud platforms.

With our services operating in the cloud, centralized office space for employees is not required and will further reduce the company's environmental impact.

People

The societal impact of our company and its services are restricted to the transparency of the companies that use it. We offer detailed reports from our audits that can provide insights into how customer information is shared between a website and its partners. If companies choose to share these reports, their customers will better understand how their information is used in exchange for the services the company provides. This has the potential to improve the relationship between a company and its customers – possibly making them more apt to share personally-identifying information.

Economy

Cereus's operations are expected to reduce the amount of time required to conduct a compliance audit against websites. These actions will minimize the manual auditing cost and the likelihood of our customers being subject to privacy lawsuits. Our customers can then focus and dedicate more resources towards achieving their goals and growing their business. Our overall economic impact is limited to the actions of our customers and is expected to be minimal.

Culture

We have the potential to influence organizations to be more transparent about the sharing of information on their customers with their partners. Traditionally, data processing and sharing are often confidential and kept internal; but with privacy becoming a concern for consumers – transparency will soon be an expectation (Meehan, 2019).

Products and Services

Cereus aims to become the leader in cutting-edge privacy compliance auditing tools. These tools will assist our customers to quickly and efficiently identify privacy and compliance issues on their websites. Most of our products will be offered as software-as-a-service with additional professional services also being made available.

Description of Products and Services

Our products and services emphasize the privacy auditing process outlined by the Information Systems Audit and Control Association (ISACA). After our customers integrate with Cereus, they will be able to conduct audits with the following steps (ISACA, 2014):

- Establish Context

There is no universally agreed-upon understanding of privacy and interpretations differ from country, culture, or organization. Within our systems, our customers will be able to define the context in which certain information their websites collect can be used.

- Identify privacy risk

Our recommendation engine will assist our customers by identifying any emerging risk areas when allowing a component of their website to run in a certain context. Some emerging risk areas include governmental regulations, big data, mobile applications, social media, and cloud security.

- Analyze privacy risk

Cereus will assign a risk score associated with a component of our customer's website should it load under certain contexts. Our customers can use this risk score to evaluate or curate any control measures, such as a privacy policy, to help mitigate any associated risk.

- Evaluate privacy risk

After evaluating the associated risk score and our customer's company control measures to mitigate any associated risk, Cereus can suggest the remaining, residual, risk score.

- Manage privacy risk

Our customers will then determine the steps to take for risk management. Such measures include avoidance, transfer, or reduction to an acceptable level and cost vs. benefit

of the risk treatment. Consent management providers can assist our customers with privacy risk management if needed.

- Communicate and consult

Audits can be scheduled based on our customer's company's requirements. The audit report can be exported and provided to stakeholders to quickly address any areas of concern.

- Monitor and review

To evaluate the performance of our customer's risk management solution; active monitoring, and periodic reviews of their privacy management and risk mitigation implementations are required. Governmental regulations and internal processes may change, which may impact their privacy risk management practices. Our automated auditing process will assist our customers to ensure that their risk management processes are based on up-to-date information.

Compliance Auditing

The Cereus compliance auditing system is a series of rules and processes configured by the user to ensure their websites meet the compliance standards that they have defined. It can be configured to scan websites during the business development cycle, automatically through the API services, or manually through our user interface. There are five main components to the compliance auditing system: the confirmation system, crawler, setup wizard, rules engine, report, and recommendation engine.

Confirmation System

The Cereus confirmation system, Figure 1, prevents organizations from conducting audits on domains that they do not own or manage. This ensures that our customers cannot use the auditor to evaluate their competitor's websites and privacy practices. When a new property (website) is added through the user interface, the user will be guided through a series of processes to confirm ownership of the domain before allowing an audit to be conducted. This process is dependent on the plan the customer is subscribed to. Any attempt to scan an unconfirmed domain will be rejected.

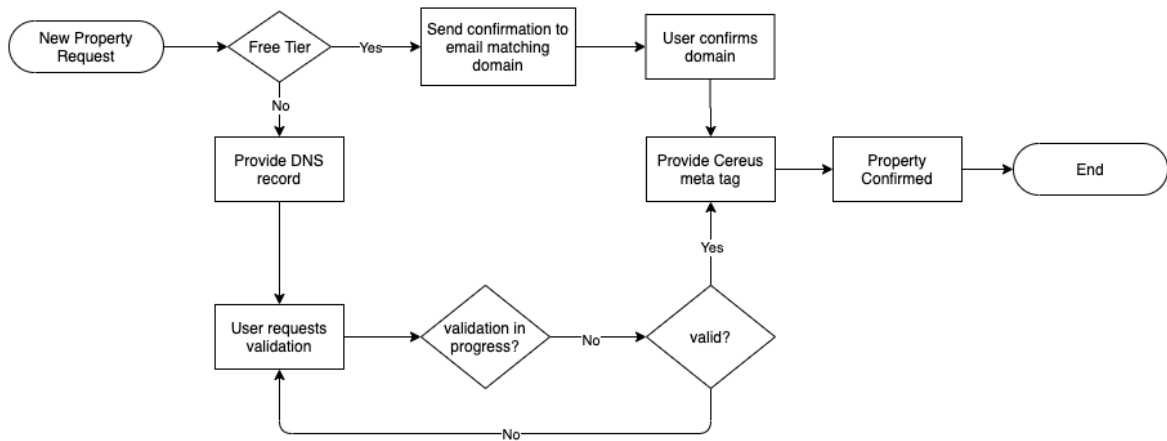
The free tier is a highly restricted plan that limits the capabilities of the auditor. This tier is intended for small business owners running a single website with limited content. For the initial confirmation of ownership of the domain, free tier users will be required to own an email address associated with the domain they are requesting to audit. In many instances, an email such as "webadmin@example.com" is dedicated to the management of

the domain. Once the customer creates the property in our user interface, they can then request a validation email be sent to their inbox with a confirmation link. When confirmed, the customer will be provided an HTML metadata tag to be included on the pages they would like to be scanned.

In the event the property on the free tier expires or is sold, Cereus will no longer be able to audit the website due to the metadata tags not being present on the site.

Figure 1

Property confirmation system



Note. The Cereus website confirmation system to ensure the organization owns the domain before scanning.

All additional tiers offer unrestricted access to our services available in the tier. Our services can provide insights into the privacy operations of the company, so additional confirmation steps are required. To confirm ownership of the property, a TXT DNS record defined by our systems will be provided to the client. In the event a domain is acquired by a new party, through the sale or expiration of the domain, we will lock access to previous reports and disable auditing services when the TXT DNS record is no longer present. The initial client who set up the domain in Cereus will be notified of the change and can re-validate if the DNS record was removed by mistake.

Crawler

The Cereus crawler is a highly intelligent and configurable service that uses artificial intelligence to scan, monitor, and classify information from validated websites. This includes all network traffic, cookies set on the page, call-trace information, performance data, request type, response status codes, headers, and redirect flags. This data is then processed by our

rules validator and aggregated by the report generator. Our recommendation engine will then suggest what actions should or must be taken to bring the website back into compliance. Unlike our competitors, this includes the exact line and position of code where the non-compliance occurred.

Configuration

The crawler can be configured in a variety of ways of meeting an organization's auditing and compliance needs. From a set or random schedule, organizations can ensure their publicly accessible website are scanned on regular basis to ensure compliance and to verify the websites are only updated through approved channels. Once the data has been processed by the rules validator and the report has been generated, the customer will receive an email notification with the audit report. Audits may also be conducted manually by a user through the Cereus user interface or triggered through the API services.

Our customers may also specify a geographic location from which the crawler will originate from. Depending on the geographic location of the visitor, privacy regulations can differ and the company may apply a different set of business rules. Running the crawler in a targeted geographic location allows our customers to validate their website's behaviors.

Actions

In many instances, features of a website may require an authorized user or action to be taken for functionality to trigger. Our customers can specify actions the crawler can take to trigger the specified site functionality. This includes clicking the specified components, scrolling, or waiting for an event to trigger.

Data Extraction and Transformation

The network and cookie data are extracted in a semi-structured format that can be translated to flat SQL tables for processing by the report generator. Data received by the proxy server can be consolidated with debug information sent by the browser. Figure 2 outlines the data collection and transformation process.

The crawler captures the requested URL for users to construct rules on the domains, locations, and query parameters. The requested URL is broken down into the requested protocol, domain, path, query, and location hash. This fragmentation significantly reduces the amount of processing required by the rules and recommendation engines. It also allows our customers to optimize their reports by establishing aggregation or exclusion rules based on part of the URL. In the instance data is sent to the server, for example, in a POST request: the data is converted to a HashMap and stored as JSON in the metadata column.

All request and response header information, depending on the browser meta event, is formatted as JSON and stored in the headers column. Signals such as the Do Not Track header signal (DNT) can be sent from the browser to indicate that the user would prefer privacy rather than personalized content (Mozilla, 2020). Site partners may respond to the DNT header, or some other setting, that the customer can monitor with the Cereus rules engine.

Setup Wizard

When a property is implemented within our system, Cereus will prompt our customers asking if they would like to set up some default rules before the initial audit. The user will identify the industry in which the property belongs and select some common partners often affiliated with the industry. At the end of the setup process, Cereus will apply the rules to the property. This is an optional process and the generated rules can be modified or removed if needed.

Rules Engine

Our customers have the option to establish rules associated with a network request or cookie to determine whether or not they meet compliance standards. These rules can be configured to target specific geographic locations to determine if an entire URL, domain, protocol, query path, or parameter, based on the specified condition, meets compliance expectations (Figure 3).

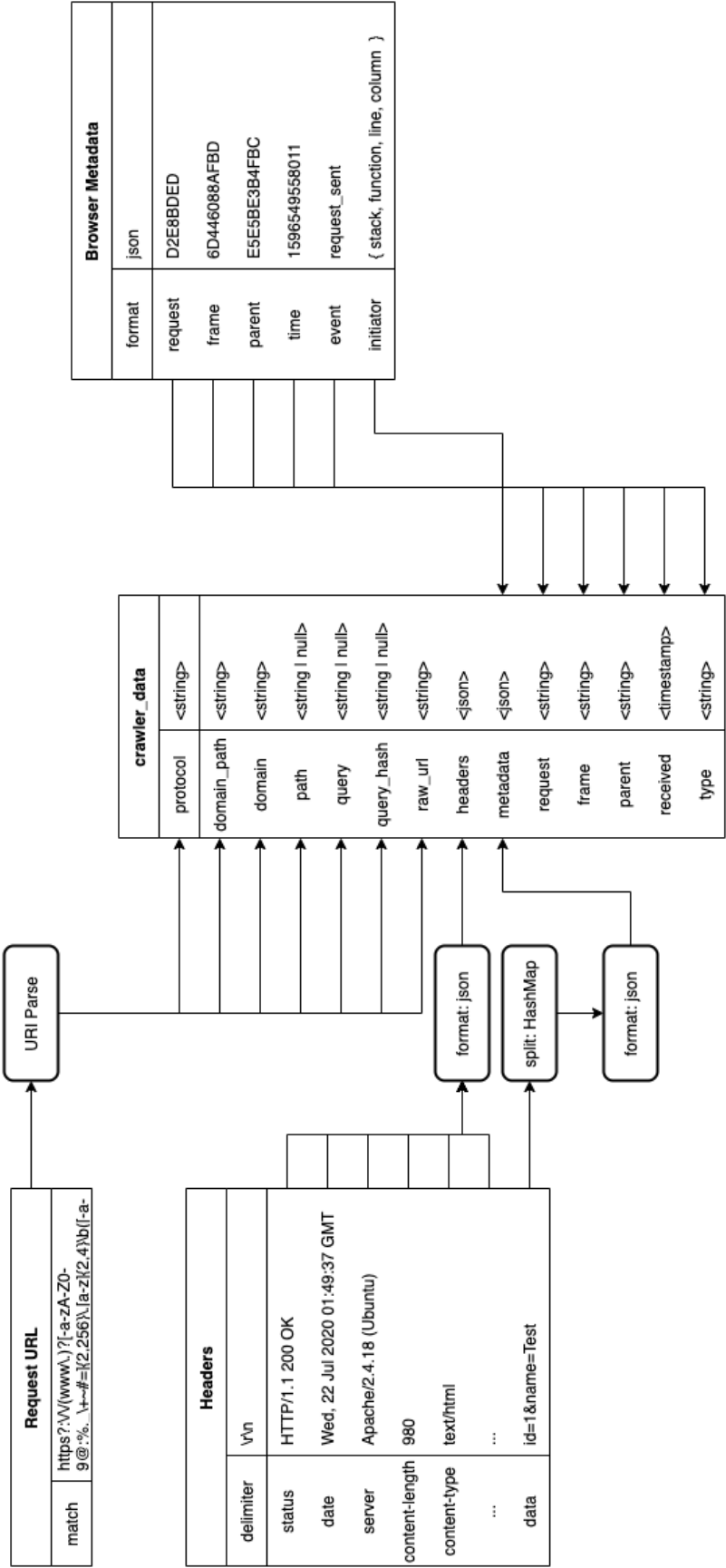
Multiple conditions may be applied to a single URL or cookie as an OR conditional. Rules may also be grouped to establish an AND conditional between two or more rules. Cereus's rules engine supports matches for values that: contain a value, equal a value, not contain a value, not equal a value, or whether or not the value matches a regular expression. Based on specified conditions, the user can specify whether or not to flag the request as compliant or not.

These rules, by default, are set at an organizational scope. All properties under the organization, when the rules engine processes a crawl, will have the same rules applied. Rules may also be overridden at a property level when exclusions are needed.

Reporting

Once processed by our proprietary Artificial Intelligence and algorithms, the Cereus audit provides insights into the requests made on the site. This incorporates the response status code, the type, size of the information exchanged, the amount of time for the request to

Figure 2
Crawler data transformation



Note. The extraction and transformation of data received by the Cereus crawler.

Figure 3

Rules definition interface

The screenshot displays the 'Rules definition interface'. At the top, there is a 'Rule name' field containing 'Compliant if NPA=1' and a trash icon to its right. Below this is a 'Locations' section with a tag 'US-Chicago' and a close button 'x'. The 'IF:' section contains four dropdown menus: 'Query', 'Contains', 'npa=1', and 'Compliant'. At the bottom, there is a blue button labeled 'ADD CONDITION RULE'.

Note. The Cereus rules engine can be configured to determine whether or not a request meets compliance standards based on the conditions specified by the user.

complete, and whether or not the request met compliance expectations (Figure 4). Any information that has no data or rules associated with it appears as a question mark (?) icon.

Each row can be broken down to dive into the information associated with the request. The deep dive includes the headers associated with the request, a cache of the original rules associated with the request (and their validation status), query parameters, data sent to the server, cookies, and the initialization chain. Web administrators and compliance managers will be able to quickly reference the audit report and identify where the compliance infringement originated.

The report filters can be used to dynamically query information from it. Users can check for specific URLs, whether or not requests were compliant, the associated category with a URL, or the page where the information was found. Our customers will receive a notification when the audit identifies requests out of compliance and can use the filter functionality to quickly pull up the request and rules information.

Recommendation Engine

Cereus can make suggestions for requests and cookies that have yet to be classified by the organization. This classification system is powered by the categorizations of requests and cookies by other organizations. The system will also crawl the domains, paths, and cookie hosts to grab meta-information to improve the accuracy of the recommendations. A risk score will also be assigned to the requests and cookies based on whether or not other organizations have flagged it as necessary to their operations.

Figure 4
Cereus audit report

(c) Benjamin J. Anderson 2018-2020

Dashboard

Admin

Companies

Classification

Crawler

Scans

Reports

Management

Users

URL

Filter URLs

COMPLIANCE

Category

PAGE

All

Category

All

Settings

Hello General Admin

Report for ISG Test Site - 8/4/2020 9:06:49 AM

Compliant	Status	Method	Domain	Path	Type	Transferred	Rendered	Time
200	200	GET	isg.cbsi.com	/onetrust/demo	Document	3.26KB	10.554KB	218ms
200	200	GET	cdn.cookieleaw.org	/scripttemplates/otSDKStub.js	Script	3.771KB	11.757KB	79ms
200	200	GET	isg.cbsi.com	/onetrust/demo/assets/css	Stylesheet	0.783KB	0.783KB	137ms
200	200	GET	stackpath.bootstrapcdn.com	/font-awesome/4.7.0/css/font-awesome.min.css	Stylesheet	7.05KB	31KB	66ms
200	200	GET	isg.cbsi.com	/onetrust/demo/assets/mountain2.jpg	Image	69.892KB	69.892KB	147ms
200	200	GET	production-cmp.isgprivacy.cbsi.com	/dist/optanon-v1.1.0.js	Script	10.33KB	36.107KB	55ms
200	200	GET	isg.cbsi.com	/onetrust/demo/scripts/googledads.js	Script	0.63KB	1.362KB	27ms
200	200	GET	isg.cbsi.com	/onetrust/demo/scripts/laboda.js	Script	0.743KB	1.932KB	137ms
200	200	GET	isg.cbsi.com	/onetrust/demo/scripts/socialmedia.js	Script	0.116KB	0.105KB	138ms
200	200	GET	vidtech.cbsiinteractive.com	/uwpjs/2.9.62/CBSI-PLAYER.js	Script	223.287KB	842.851KB	62ms
200	200	GET	isg.cbsi.com	/onetrust/demo/scripts/uwp.js	Script	1.008KB	2.501KB	147ms
200	200	GET	isg.cbsi.com	/onetrust/demo/assets/W3.css	Stylesheet	5.216KB	23.361KB	60ms
200	200	GET	cdn.cookieleaw.org	/consent/d574630f-3a56-4bd3-8e42-786db...	XHR	1.166KB	2.693KB	422ms
200	200	POST	isg.cbsi.com	/onetrust/demo/	Fetch	3.26KB	10.554KB	142ms
200	200	GET	securepubads.g.doubleclick.net	/tag/js/gpt.js	Script	49.699KB	49.699KB	144ms
200	200	GET	adservice.google.com	/adsid/integrator.js	Script	0.104KB	0.109KB	198ms
200	200	GET	securepubads.g.doubleclick.net	/gpt/pubads_impl_2020073001.js	Script	262.677KB	262.677KB	34ms
200	200	GET	geolocation.onetrust.com	/cookieconsentpub/v1/geo/location	Script	68.808KB	0.19KB	254ms
200	200	GET	cdn.cookieleaw.org	/scripttemplates/6.4.0/cbBannerSdk.js	Script	331.873KB	331.873KB	19ms
200	200	GET	cdn.cookieleaw.org	/consent/d574630f-3a56-4bd3-8e42-786db...	Fetch	10.973KB	41.425KB	201ms

PREVIOUS PAGE

NEXT PAGE

Note. The Cereus audit report provides clean, familiar, interface for privacy compliance teams.

Risk Score

When a new request or cookie is identified on a website, through an initial or later scan, an associated risk score with allowing it to load in a list of geographic locations. This score is merely a suggestion based on the operations of other organizations and no action needs to be taken.

$$s_{risk} = \frac{r_n}{O_r}$$

The risk score is computed as the number of records classified as necessary r_n divided by the number of organizations in which r_n is found (O_r). This will always result in a ratio between 0 and 1 in which intervals of $\frac{1}{3}$ will determine if the request will be rated as low, intermediate, or high risk.

To reduce the possibility of organizations incorrectly flagging a request due to the scoring system, the risk score will only be provided when a sample size of at least 20 organizations have classified the request or cookie.

Categorization Recommendation

Cereus will provide categorization recommendations for requests and cookies based on meta-information extracted from the request or cookie's origin. The recommendation engine will also incorporate organization classification information about the request or cookie. Classification records within Cereus's internal systems are expected to be single words or small phrases, much like meta-tag information present on a web page. This information can best be represented as a bag of words. There's no context to meta-tag data or the collection of classifications entered by users, so the representation of language or order has no meaning (Manning, 2008).

The recommendation engine is powered by a Bernoulli document model. The model takes a document and partitions it into a feature vector of binary elements. If a word is found in the document, it will receive a value of 1, otherwise 0. It does not take into account the frequency of a word, but whether or not the word is present. The model can then calculate the probability of a word occurring in a document with a specific classification, as well as taking into account the probability of it not occurring.

To save reduce the computational power required to provide recommendations, the model calculates estimated probabilities for a request or cookie belonging to a category.

$\hat{P}(w_i|C_k)$ defines the estimated probability that the word w_i occurs in a document, D , with the classification (C) k . The estimated probability that the word w_i not occurring is $1 - \hat{P}(w_i|C_k)$. V represents the model's vocabulary and v consists of the feature vector of the

document. The product of the probability of each item (i) in the feature vector occurring or not occurring determines the overall estimated probability of the document being classified as class k ($\hat{P}(v|C_k)$).

$$\hat{P}(D|C_k) = \prod_{i=1}^V [v_i \hat{P}(w_i|C_k) + (1 - v_i)(1 - \hat{P}(w_i|C_k))]$$

There are two parameters for this model: the probabilities of each word in the document class ($\hat{P}(w_i|C_k)$) and its prior probabilities $P(C_k)$. The estimated probability that a word w_i occurs in a document is the number of documents n classified as k divided by the total number of documents N classified as k .

$$\hat{P}(w_i|C_k) = \frac{n_k(w_i)}{N_k}$$

Where the prior probability of class k can be estimated as the relative frequency of documents containing class k .

$$\hat{P}(C_k) = \frac{N_k}{N}$$

The output of the model will be an array of estimated probabilities. Each probability in the array is associated with a category defined within Cereus's system. The category with the highest probability is recommended to the user.

Notifications and Alarms

Users can configure Cereus to notify the specified stakeholders if an audit discovers new requests or cookies, compliance checks fail, or when a new scan is scheduled. To reduce the likelihood of users ignoring these notifications, they can be configured on an organizational level or per property. These settings ensure that notifications are sent only to the significant parties and reduce email clutter.

API Services

Professional and Enterprise customers may use Cereus's application programming interface (API) services to automate their privacy operations. Our customers who actively curate new content, use a continuous integration (CI) system to control website deployments, or those who may not follow a strict deployment schedule can use the API to integrate Cereus into their daily business processes.

Crawl Requests

The crawl request endpoint allows customers to trigger a crawl against a property. By default, this will scan all paths defined on the property. Our customers also have the option to specify the path(s) they would like to crawl in the event they want to target only new or updated pages.

WebHooks

When an audit has been completed, it will notify stakeholders stating whether or not compliance checks were successful. Cereus can also notify other computer systems. Through webhooks, our customers can configure Cereus to send audit status messages to their computer systems. The customer can then process the message and take action against the messages.

Professional Services

Our professional services will serve a clientele requiring guidance on privacy regulations applicable to their operations. We will consult the client to identify the best plan for the client and assist with the configuration of our tools to reflect their needs. Training services for Cereus's products will also be offered.

Competitive Advantages and Disadvantages

The privacy industry, though relatively new, already consists of some large organizations servicing a significant amount of the market share. In April of 2020, OneTrust had a 35.5% stake in the data privacy management software market (OneTrust, 2020). We intend to enter the privacy software market by automating an otherwise manual process: compliance auditing.

Competitive Advantages

1. Founders are experienced software engineers

Cereus's founders are experienced software engineers. Providing software-as-a-service requires the software to be developed, maintained, and readily available. Cereus's founders will be able to construct its systems to be scalable and maintainable to accompany organizations of any size.

2. Founders are experienced product managers

Cereus's founders are experienced product managers. The founders can clearly define Cereus's product vision and prioritize feature requests to meet customer requirements.

3. Founders have experience in marketing and accounting

Cereus's founders have formal education and experience in marketing and accounting. The founders will be able to significantly reduce the initial start-up costs by managing their marketing campaigns and customer accounts.

4. Founders have a background in data science

Cereus's founders have a background in data science. Cereus will collect, process, and store large amounts of information for their customers. When large datasets come into play, storage costs, data integrity, and performance issues are common. With a formal background in data science, Cereus's founders can mitigate all of these problems.

5. Cereus provides actor stack traces

In the event a request or cookie fails to meet company compliance standards, Cereus provides stack trace information that allows the user to locate the file and exact line of code that triggered the validation failure. This saves the company time and money from having to manually trace the source.

6. Cereus extends cookie compliance

Cereus extends the industry standard of cookie compliance (user consent is required only for cookie tracking) by providing insights into network requests. This provides a full-scope audit of the website and how information is shared between it and its partners.

Competitive Disadvantages

1. Cereus is not a consent management platform

Cereus does not provide consent management services for its customers; it augments existing consent management platforms and solutions. Cereus's customers will need to purchase a consent management solution or implement their own.

2. Adoption requires legal support

Tools used to automate legal compliance often require privacy attorneys to validate whether or not the tools are effective (Merken, 2019). Cereus will require legal support before companies utilize our services.

Pricing Structure

We aim to serve medium to large-sized organizations managing multiple websites. We do, however, offer a flexible pricing structure, including a free tier, to accommodate companies of any size. Table 1 provides an overview of each tier and the services provided. The Pricing and Positioning Strategy section provides details on how our baseline pricing is calculated.

Free

We offer our auditing services, with limitations, for free. Free-tier users are authorized to register one website but will not be able to benefit from the company's API, webhook, recommendation, notification, or professional services. They are limited to running 10 audits per year against a running total of 12 pages.

Personal

The Personal tier enhances the Free tier by incorporating our notification system into the audit process. It expands auditing to five pages of the customer's website once per month. The recommendation engine will further assist our customers by offering insights into the categorization of requests and cookies found in the audit. One user may be set up to access the organization's information within Cereus.

This is a monthly subscription that can be canceled at any time.

Professional

The Professional tier provisions up to five users to be set up to access the organization's information within our systems. It expands the Personal tier to allow our customers to register up to five of their websites. Each website can have up to ten pages audited twice a month with the option to integrate webhooks into their auditing processes. Our professional services are also offered for an additional fee.

This is a monthly subscription that can be canceled at any time. A yearly subscription is also available at a 5% discount.

Enterprise

Enterprise customers have access to all of our services in addition to 40 hours of professional services per year. The option to have the auditor crawl a sitemap as opposed to manually defining pages, with a limit of 100 pages, is available. 25 websites can be registered and audited up to 4 times a month. 25 users may be set up to access the organization's information.

This is a yearly subscription that cannot be canceled.

Select

There are no one-size-fits-all pricing models that fit every customer's needs. Our Select tier offers customers the ability to tailor a customized experience at a fixed, yearly, rate.

Industry Background

As new governmental regulations are imposed due to data breaches, fines, and growing awareness of how personal data is collected and processed; the privacy technology industry is growing rapidly – with one company being valued at over \$2.7 billion after being founded only 4 years since its valuation (Hughes, 2020). We also see large data collection and processing companies being hit with record-breaking fines. In 2019, the FTC fined Facebook \$5 billion and imposed strict privacy restrictions (FTC, 2019). This set a new precedent that all companies are accountable for the decisions they make about their users' privacy.

As customers are becoming more aware and passionate about what companies are doing with their data, the need for privacy technology is expected to continue to grow (Meehan, 2019). Governmental regulations will continue to focus on making companies accountable for the data they collect and require them to follow various guidelines. In instances where the regulations are too complicated for companies to implement or manage on their own, privacy vendors can step in and assist.

Target Market Segment

At Cereus, we offer flexible subscriptions for any sized organization that's looking for privacy compliance auditing. It may, however, be difficult to market smaller companies that our services are worth mitigating the risk of being fined. We will focus our marketing efforts on medium-to-large organizations, with multiple websites, who are currently, or will be, working with a consent management system.

Medium-to-large organizations will often attract a larger, more diverse, customer base. Their customers determine the privacy regulations the company has to adhere to. As a company grows, collects, and processes more information, it may attract the attention of customers or governmental agencies – making the company more subject to fines or legal action should they be found out of compliance. With more regulations, our customers would have to dedicate resources towards manually auditing their websites for each regulation to mitigate the risk of lawsuits or fines. At Cereus, we automate this process and follow the

Table 1*Cereus pricing tier and services provided.*

Tier	Subscription	Price	Users	Websites	Pages	Scans/Mo	Prof.Services	API	Web hooks	Notifi.	Rec.
Free	Monthly	\$0.00	1	1	1	1	✗	✗	✗	✗	✗
Personal	Monthly	\$39.00	5	1	5	1	✗	✗	✗	✓	✓
Professional	Monthly	\$99.00	10	5	25	2	Additional	✗	✓	✓	✓
Enterprise	Yearly	\$1,299.00	25	25	100	4	✓	✓	✓	✓	✓
Select	Yearly	Custom	N	N	N	N	Opt.	Opt.	Opt.	Opt.	Opt.

rules defined by our customers without any margin of error, making our costs more justifiable in contrast to smaller companies.

Marketing Plan

Industry Background

Market Size

According to QY Research, North America and Europe are currently holding the largest share of the privacy management software market (QY Research, 2020). In 2019, this market size was estimated at US \$808.8 million and expected to reach \$6.1 billion by the end of 2026 with a compound annual growth rate of 33.1% from 2021 through 2026. These estimates were based on privacy management software trends in North America, Europe, China, Southeast Asia, India, and Central and South America.

Market Trends

Privacy awareness has led to the passing of privacy regulations across an increasing amount of countries due to the passing of the General Data Protection Regulation (GDPR) for European Union citizens and large data breaches exposing the personal information of hundreds of millions of consumers (PrivacyPolicies, 2019). Other countries, including Brazil, Canada, Australia, and various U.S. states have enacted or began enforcing, their privacy laws with heftier fines or sanctions. The primary difference between regulations being passed now, in contrast to the past, is the heavy fines and sanctions regulators can impose on companies who are non-compliant (Matteson, 2020). These sanctions and fines are designed to force businesses to comply with regulations and how they process their customer's information.

In a survey conducted by Auxier, Rainie, Anderson, Perrin, Kumar, and Tuner, 62% of Americans believe it is not possible to go through daily life without having their data collected, 81% believe that they have very little to no control over their information companies collect about them, and 72% feel that all, or almost all of what they do online is being tracked (Auxier, 2019). The survey also revealed that most Americans are not confident that companies would publicly admit to misusing their customer's data, but still say data collection and usage is acceptable for processing in some ways.

Citizens of countries belonging to the European Union, 1 year since the passing of the GDPR, are rapidly becoming aware of their privacy rights (European Commission, 2019). A survey conducted by the European Union Commission against 27,000 Europeans revealed that 73% of citizens have heard of at least one of their privacy rights with the highest awareness being the right to access their data (65%), the right to correct their information a company has on them (61%), and the right to opt-out of direct marketing (59%).

Other trends involve the usage of smart mobile devices. According to the FTC, information from smartphones, such as location information, is considered sensitive (Federal Trade Commission, 2012). The location information can be used to provide, unwanted, targeted marketing to consumers based on their movements. Mobile applications can use the hardware identifiers associated with devices to uniquely identify consumers or potentially access utilities not required for the intended purpose of the application (Tama, 2012).

Growth Potential and Opportunity

In the Market Size section, QY Research identified a compound annual growth rate of 33.1% from 2021 through 2026. The Market Trends section identified emerging trends such as privacy awareness, information control, and concerns with smart mobile devices. We can anticipate that governments will further regulate how companies can process consumer information based on the rapidly growing privacy software market and rising awareness and concerns with privacy. Further regulations will increase the demand for consent management vendors (as predicted by QY Research) and automated privacy auditing services to ensure privacy risk is mitigated.

Market Barriers

Even with governmental regulations, hefty fines, and sanctions; the adoption of consent management platforms (CMP) isn't widespread and integrations often don't meet compliance regulations (Nouwens, Liccardi, Veale, Karger, & Kagal, 2020). In an audit conducted by Aarhus, Cambridge, and UCL Universities, of the top 10,000 websites in the UK, only 11.8% met the minimal requirements set by their audit based on European law. Of this sample, only 20.35% of websites report using a CMP. In addition to the top 10,000 websites, in a sample of 1,000 consent management platform vendors, 95.8% provided either no consent choice or confirmation only.

A long-term study of the impact of GDPR on cookie placement also revealed that (Trevisan, Traverso, Bassi, & Mellia, 2019):

1. 49% of websites placed cookies before receiving consent.
2. 28% of websites didn't provide any consent mechanism.
3. The percentage of websites violating GDPR stayed constant for 4 years, indicating any consent mechanisms implemented were ineffective.

The primary barrier for Cereus to successfully provide privacy auditing services will be industry acceptance. A majority of integrations with consent management solutions fail to

meet compliance standards (Nouwens et al., 2020). We will have to differentiate ourselves from consent management providers looking for a piece of a booming market and emphasize that we are not a consent management solution. Cereus is an auditing and risk mitigation solution that evaluates integrations with CMPs. Should a CMP integration fail to adhere to the defined rules within our auditing system, those failures will be reflected in the audit report.

Market Changes

As an automated privacy auditing company, Cereus is moderately affected by fluctuations in the privacy software market due to changes in privacy legislation and regulation. Response to changes will, generally, be the responsibility of our customers – they will be able to alter their business rules within our systems to ensure that any new legislation is accounted for. To support our customers, our professional services staff will receive training on any new or changes to legislation.

In the event legislation expands or is implemented in geographic locations that we do not yet support, our Engineering staff will make the appropriate changes before the enforcement of the legislation.

Products and Services

Customers with a privacy program may see auditing as the next logical step towards ensuring compliance and privacy risk mitigation measures are being followed across all of their properties. Depending on the size of their organization, manual auditing may be a possibility. Customers will also have to consider the costs associated with manual auditing, the possibility for human error, and the frequency in which the audits must be conducted.

Other customers looking for privacy management solutions may not consider auditing and risk management as a priority. They understand that their websites need to comply with relevant laws and a consent management platform can assist them with compliance. These customers will look through our products and services and will quickly identify that we do not offer a consent management solution, so why would they choose our services?

A consent management platform seems like the first logical step when viewing privacy legislation trends and actions our customer's competitors may be taking. We also believe that a consent management platform may not be required given the customer's audience, business practices, and tooling. After conducting an audit and identifying any privacy risks our client's businesses are susceptible to, they will be able to determine an appropriate course

of action. That course may include implementing a consent management platform or possibly using open-source solutions that will mitigate risk.

We offer highly customizable products and flexible pricing (even free). Our customers have the potential to: identify whether or not they need a consent management platform, the associated risk of not implementing one, and the effectiveness of their integration should they implement a consent management platform.

Auditor and Reporting

Any customer, whether they have implemented a consent management platform or not, will first look towards how auditing and reporting will be provided. More importantly, what information the audit contains and how it can be distributed.

Unique Selling Proposition

Customers will define compliance rules and actively monitor all their properties to ensure that their websites meet their compliance standards.

Features and Benefits

- Customizable

The proprietary crawler will validate our customer's compliance rules against their websites.

- Interactive

Customers will verify the results of their audits in our interactive report. It identifies which of their properties failed to meet their compliance rules and where the infringement occurred on the website – down to the line of code causing the infringement.

- Exportable

Export the audit into a distributable format to share with stakeholders.

- Automated

Schedule audits to reflect our clients' development cycle and quickly identify compliance infringements before they are distributed to their customers.

Notifications and Alarms

Customers may wonder how long an audit will take to run against their websites and, unfortunately, there is no definitive answer. Audits depend on how many pages the crawler must scan and the execution speed of their website. All of our customers, except those using the free tier, may specify who, if anyone, will receive notifications of when audits complete for each property, as well as an alarm, should compliance checks fail.

Unique Selling Proposition

Cereus grants our customers peace of mind by notifying them should one of their websites fall out of compliance.

Features and Benefits

- Customizable

Specify which stakeholders, at an organization or property scope, to notify when audits complete and/or when compliance checks fail.

- Prompt

Customers will not have to step away from their tasks to check on the status of audits. Cereus will notify customers as soon as their audits are complete.

Classification and Recommendation Engine

All our customers, excluding those on the free tier, will see our audit system provide a risk score, residual risk score, and suggest a category for partners running on their website. To assist our customers with the evaluation of their partners, we have aggregated resources to assist with configuring business rules within our systems.

Unique Selling Proposition

We assist our customers with establishing business rules by providing insights into the operations of their partners. We then suggest a course of action for their websites.

Features and Benefits

- Automated

Cereus will automatically calculate the risk score and residual risk score should a partner load on a customer's website in specific geographic locations. This score is based on

the actions taken by our other customers, vendor information, and the privacy policy present on the website.

- **Productivity**

Our customers can make informed decisions about mitigating any risk associated with their partners through the resources we've collected.

API

Organizations actively developing their websites will look for functionality that enables them to integrate privacy compliance and risk management into their daily operations. Our application programming interface (API) provides a variety of features to support a continuous integration system. This is available for our professional, enterprise, and select customers only.

Unique Selling Proposition

Customers will automate privacy compliance and risk management by integrating our API into their business operations.

Features and Benefits

- **Efficiency**

Customers can include privacy compliance and risk management in their continuous integration systems. They can run audits on-demand and let us send the results to their systems.

Professional Services

Not all organizations have the time or resources to dedicate towards running a privacy audit and risk management division. Professional and enterprise customers have the option to allow our professional services staff to configure our systems to meet their privacy compliance and risk management requirements.

Unique Selling Proposition

We will assist our customers by configuring our systems to meet their privacy compliance and risk management requirements.

Features and Benefits

- Support

Staff readily available to assist with customer integrations, setup, and general questions.

- Active Management

Our professional services staff can configure and manage our systems to meet our customer's privacy compliance and risk management requirements.

Customers

We offer flexible subscriptions for any sized organization that's looking for privacy compliance auditing. It may, however, be difficult to market smaller companies that our services are worth mitigating the risk of being fined. Our customers will primarily be medium-to-large organizations, with multiple websites, who are currently, or will be, working with a consent management system.

Demographic Considerations

The geographic location of our customers and their client-base are some factors to consider when defining the demographics of our customers. The location of our customers and their client-base define the regulations they have to adhere to. Should an organization chooses to restrict their client-base due to data and privacy regulations, our services may not be required.

Proposed Location

Cereus will be incorporated in the United States. There will be no leased or physically owned real estate. Physical correspondence to Cereus will operate through a PO Box.

Pricing and Positioning Strategy

The pricing of Cereus's products is determined by estimating the profit margin of each pricing tier, excluding professional services. We aim for a profit margin of 90% (+/-5%) during our first year. As our company grows, it'll be our goal to keep these margins around 12% as more software, support, and marketing staff is required.

Each pricing tier is based on the average industry rate for conducting a GDPR audit. Taking into consideration that Cereus only audits websites and not internal systems, we cut the cost of conducting a GDPR audit by 50%. The random sampling of auditing businesses

identified an average cost of \$945.00 to conduct a GDPR audit for a small company with a single website and database (DMPC Ltd, 2020). Our personal tier is priced at \$468.00 per year – 49.6% of the cost to conduct an audit against a small company (Table 1).

To estimate the profit margin for each tier, we monitored the actions of a full professional tier organization over a month during a beta phase. The monitoring revealed an average of about 2,500 API requests per user were made, with an average of 1.2GB of traffic, and the organization scanned 10 websites with 25 pages, twice. 20 notification and webhook events were sent, averaging 1kB in size. Each scan resulted in an average report size of 2.5kB.

After the beta phase concluded, Cereus’s founders created an isolated environment and simulated the actions of the professional organization. 24 hours after the simulation, Amazon’s cost explorer identified a spike in projected costs of \$304.72 with an average of \$10.15 per day.

The cost explorer identified the following components as having the most significant impact on the projected costs. We derived an equation for each of the components, using Amazon’s pricing and the features available for each of our subscription tiers (Table 1), to compute the estimated cost. Each equation was able to accurately compute the amount reflected in the cost explorer within a 4% margin of error.

- Loadbalancer (API) Network Traffic

$$ELB_{est} = (0.008 * (N_{users} * B_{api})) + (N_{users} * 2500 / 1,000,000) * 0.40$$

- Cloudfront Network Traffic

$$CF_{est} = (0.085 * N_{users} * 1.2_{gb})$$

- S3 Storage Costs

$$S3_{est} = (0.023 * (N_{websites} * N_{pages} * N_{scans} * 0.0000026_{gb}))$$

- NAT Gateway Traffic

$$NAT_{est} = (0.045 * (N_{websites} * N_{pages} * N_{scans} * 0.0000026_{gb})) + (0.045 * (N_{websites} * N_{pages} * N_{scans} * 0.000001_{gb}))$$

The costs between our queue, email, scan, database backup, and audit systems were also reflected in the cost explorer. Due to these systems being part of our standard infrastructure operations, as discussed in the Operational Costs section, the costs associated with these had to be estimated.

A second test against the websites a beta tester belonging to the personal tier was conducted to help determine a constant value for the additional costs associated with our internal systems. Report sizes were smaller due to the tier being limited to a total of 25 pages, in

contrast to 250 in the professional tier – but only within a few hundred bytes due to the file compression we apply to our audits. Our estimated costs increased by \$2.04 per day with this test.

Given the two tests, a constant value C equal to 19.992 (rounded to 20), multiplied by the sum of the associated cost of each component, estimated the monthly costs associated with both tests within a 2% margin of error. Giving us the equation:

$$Plan_{cost} = C * (ELB_{est} + CF_{est} + S3_{est} + NAT_{est})$$

Operational Costs

Operational costs are broken into two main categories: infrastructure and administration. Infrastructure includes all technical requirements to support operations. Administration includes wages, marketing, accounting, and professional service expenses.

Infrastructure Costs

Cereus will manage its infrastructure through Amazon Web Services (AWS). AWS offers an alternative solution to physical infrastructure management at a competitive rate. Cereus will require the following services from Amazon to support the auditing of 100 websites:

1 A1.Medium Spot Instance

The scan servers to collect information from our customer’s websites can be reserved spot instances that operate only on demand. These servers come at a discounted rate but introduce some latency between a customer’s audit request and its completion. Each server is expected to be able to scan up to 10 websites at a time.

Pricing can be calculated with the following formula where t is time in hours and n_{a1s} is the number of servers:

$$Scan_{cost} = 0.0049tn_{a1s}$$

2 A1.Medium Reserved Instances

Cereus operates on a client-server model, in which the client will operate as ”serverless” through S3 and a CDN. The API services for the server portion must be available at all times with limited latency. This comes at an additional cost in contrast to spot instances but will ensure our customers can request information on-demand.

Pricing can be calculated with the following formula where t is time in hours and n_{a1r} is the number of servers:

$$Api_{cost} = 0.0255tn_{a1r}$$

2 S3 buckets

All audit information will be stored in a private Amazon S3 bucket. Cereus's landing page and user interface will be hosted through S3 as well.

Pricing can be calculated with the following formula where g_{s3} is the size of all S3 buckets in gigabytes (for the first 50 terabytes):

$$S3_{cost} = 0.023g_{s3}$$

1 Cloudfront Instance Across All Edge Locations

Cloudfront will serve as our CDN layer for our landing page and user interface. This will significantly reduce the latency of serving content to our customers.

Pricing can be calculated with the following formula where g_{cf} is the size of all traffic in gigabytes (for the first 10 terabytes):

$$CF_{cost} = 0.085g_{cf}$$

1 Network Address Translation Gateway (NAT)

To protect our proprietary technologies and customer's data, Cereus's services will primarily reside in a private network within AWS. The NAT will allow our internal network to communicate with the internet.

Pricing can be calculated with the following formula where g_{nat} is the size of all traffic in gigabytes and t is the total time in hours:

$$NAT_{cost} = 0.045t + 0.045g_{nat}$$

1 Replicated Postgres Instance

Cereus will store its customer information and configurations in a Postgres database. Data will be replicated across two instances for high availability.

Pricing can be calculated with the following formula where t is the total time in hours:

$$RDS_{cost} = 0.072t$$

1 T2.Small Elasticache Instance

Scheduled scans and notifications will operate through a queue-consumer implementation. Amazon's Elasticache service will serve as a queue.

Pricing can be calculated with the following formula where t is the total time in hours:

$$ELC_{cost} = 0.034t$$

API Loadbalancer

Though only 1 API instance is needed for minimum operations, should that 1 API server fail, Cereus's customers will not be able to access their configurations or audits. Running 2 API instances with a Loadbalancer will prevent all operations from halting due to one server going offline.

Pricing can be calculated with the following formula where g_{elb} is the size of all traffic in gigabytes and t is the total time in hours:

$$ELB_{cost} = 0.025t + 0.008g_{elb}$$

1 Route53 Hosted Zone

Route53 is Amazon's domain-name server resolver. Cereus's domain service provider can route requests from our domain to our servers, through Route53, hosted on Amazon.

Pricing can be calculated with the following formula where r_m is the number of requests (per million, up to 1 billion):

$$R53_{cost} = 0.50 + 0.40r_m$$

Using the cost formulas defined for each Amazon service, we can calculate our operations costs with the following formula (simplified):

$$C = 0.176t + 0.0049tn_{a1s} + 0.0255tn_{a1r} + 0.023g_{s3} + 0.085g_{cf} + 0.045g_{nat} + 0.008g_{elb} + 0.40r_m + 0.50$$

Preliminary testing estimated that the following variables would accommodate the auditing of 100 websites on the professional subscription tier:

- 2 Scan Servers
- 1 Reserved API Instance

- 1.5GB S3 storage/mo
- 5GB of traffic through Cloudfront
- 1GB of traffic through the NAT
- 10 million requests

The estimated monthly cost for infrastructure operations would be around \$157.14, based on Amazon's 720-hour billing cycle (30 days) (Amazon, 2020a) and the operations cost formula.

Administration Costs

- Wages and Benefits

The only employees of Cereus will be its three founders, who will not take a salary, dividends, or benefits during its first year of operations. Two of the founders will contribute to the company part-time while they contribute to their main source of income, the other will dedicate a full-time schedule towards the company's operations. The refusal of monetary compensation during the first year will allow the founders to invest any gains back into the company and help it grow.

- Marketing

Cereus's founders will conduct initial marketing campaigns through professional social media platforms, popular search engines, and our website. These, initially, come at little to no cost. A budget of \$250 per month to serve targeted advertisements on popular search engines and social media platforms will be allocated. After assessing the performance of our marketing efforts, we will re-evaluate our strategies to grow our customer base.

- Accounting

According to SCORE, in 2015, most small business owners spent at least \$1,000 in accounting administration costs, internal expenses, and legal fees each year (SCORE, 2016). 31% of business owners reported spending between \$1,000 and \$5,000. Taking into consideration the subscription model Cereus follows (Table 1), \$200 per month will be reserved for accounting purposes.

- Professional Services

Cereus's professional services and support will be run by the three founders with one dedicated 40 hours per week. In the event the demand for professional services exceeds the capabilities of the founders, Cereus will hire part-time support staff as needed.

Competitive Analysis

Cereus provides automated privacy compliance auditing and risk management services. This is an extremely niche and relatively new market that is often conglomerated with the information security auditing industry. Most of Cereus’s primary competitors will be those who conduct audits manually. Secondary competitors will be consent management platforms that have the capabilities to implement automated auditing into their systems. Table 2 provides a competitive overview of our services, whereas Table 3 evaluates our competitors.

Table 2

Cereus competitive overview.

Factor	Cereus	Strength	Weakness	Importance
Products	Automated and configurable.	x		High
Price	Fixed and flexible pricing models.	x		Medium
Quality	High.	x		High
Selection	Limited to system-defined geographic locations.		x	High
Service	Support limited to professional and enterprise customers.		x	Medium
Reliability	Cloud service replicated across multiple regions.	x		High
Stability	New company.		x	High
Expertise	Founders are privacy, software, product, and marketing experts.	x		Medium
Reputation	Unknown.		x	Medium
Location	United States.			Low
Appearance	Audits and configuration will be conducted through our website.			Medium
Sales	Primarily B2B with some B2C sales.			Low
Credit Policy	No credit. Monthly or yearly subscriptions.			Low
Advertising	Digital/Online.			Low
Image	Opinion. Unestablished.		x	Medium

Table 3
Cereus Competitive Analysis.

Factor	Altius	OneTrust	Crowpeak
Products	Manual IT security, privacy, and risk consultation.	CMP, data mapping, and professional services.	CMS, CMP, and accessibility services.
Price	Fixed contract rate.	Fixed and customized rates.	Fix subscription rates.
Quality	High: customer reviews.	High: customer and business reviews.	Medium: customer and business reviews.
Selection	Broad range of security, risk, and compliance consulting services.	Configurable, automated, CMP solutions.	Limited to an automated CMP solution (pertaining to privacy).
Service	Consulting.	SaaS and consulting.	SaaS and consulting.
Reliability	Unknown.	High.	High.
Stability	Well established (1993).	Established (2016).	Well established (2001).
Expertise	25 years of audit and security experience.	Consent management, privacy regulation, and data governance.	Digital experience management.
Reputation	Thorough.	CMP leader.	Digital experience leader.
Location	United States.	United States.	United States.
Appearance	Antiquated web presence.	Professional, modern, web presence.	Professional, modern, web presence.
Sales	Consulting.	B2B, B2C, and consulting.	B2B, B2C, and consulting.
Credit Policy	Unknown.	None.	None.
Advertising	Web presence.	Web, social media, and search engine advertising presence.	Web, social media, and search engine advertising presence.
Image	Professional consultancy.	Professional data and privacy SaaS provider.	Professional DMX SaaS provider.

Return on Investment

Table 4 highlights each of Cereus’s subscription tiers. Each column reflects the tier’s pricing, the estimated profit per month (using the equation described in the Pricing and Positioning Strategy section), the estimated profit margin (without professional services), and the number of subscriptions required to break-even given the infrastructure costs (\$157.14), accounting budget (\$200.00), and marketing budget (\$250.00).

Table 4

Cereus subscription break-even analysis.

Tier	Price	Cost	Profit	Margin	Break-Even
Free	\$0.00	\$0.10	-\$0.10	0	N/A
Personal	\$39.00	\$2.06	\$36.94	0.947	17
Professional	\$99.00	\$10.32	\$88.68	0.896	7
Enterprise	\$1,299.00	\$55.86	\$1,243.00	0.957	1

Sales and Distribution

Sales Strategy

Initially, all purchases of our services will be available only through our website. The founders will be available via email to handle any purchase inquiries. In the event an organization inquires about our Enterprise or Select tier subscriptions, the founders will conduct a product demonstration if requested.

Distribution Methods

Cereus offers software-as-a-service with professional services available for professional and enterprise customers. There are no physical products to distribute and any purchases will be immediately available to our customers.

Transaction Process

Transactions will be handled through Cereus’s website. After a customer registers their organization, they will be prompted to provide credit card information. Once entered in, a billing profile will be set up with our credit processing provider, Authorize.net. Accounts will be billed the first of every month. If a transaction fails to process, Cereus will no longer authorize the auditing of any websites under the organization and the customer will be notified. If an account is delinquent for more than one billing cycle, the account will be closed.

Returns and Refunds

For monthly subscriptions, Cereus will not offer returns for the purchase of our services. Should an organization with a yearly subscription inquire about canceling their subscription, Cereus will charge a 10% processing fee against the cost of the subscription.

Advertising and Promotion

Advertising and Publicity

As outlined in the Administration Costs section, Cereus will focus its digital advertising efforts on professional social network platforms and search engines. We believe that a purely digital approach will allow us to gain traction in the privacy auditing industry. This may lead to technical publishers and journals reviewing our products and services – offering more exposure while keeping our marketing costs low.

We encourage our customers to review our products for further exposure, but there have been mixed findings regarding the impact of review valence and customer responses, specifically to the possibility of reviews being moderated (Maslowska, Malthouse, & Bernritter, 2017). Customers aware of deceptive practices with reviews were found to have different intentions, and attitudes, towards products based on the review valence (Karabas, Kareklas, Weber, & Muehling, 2020). Should our products ever get perfect reviews across services that support the rating of our company, we anticipate these customers would approach us with skepticism. Poor reviews, deceptive or not, may prevent customers from even considering us.

To help mitigate negative reviews, initially, we will rely heavily on customers testing our products and services with our free tier before purchasing a subscription. Our monthly subscriptions are non-refundable, which we suspect will be a major factor for negative reviews. Initially, we will routinely monitor reviews across popular platforms such as Google Reviews. As our company grows, the marketing staff will be able to actively monitor reviews to address customer concerns and complaints.

Sales Promotion

Cereus will offer a 5% early adopters discount to all customers who purchase a subscription within the first year of our founding.

Web

Our website's landing page will feature all of our products and services. It will support all major browsers and be responsive to mobile devices. We will present a call-to-action for

all visitors, prompting them to try our services for free with our free tier. We will advertise that, after evaluating the products available in the free tier, the customer can upgrade to any one of our subscriptions at any time.

Sales Forecast

Based on the marketing and promotional strategies outlined in the Advertising and Promotion section, a 12-month sales forecast was generated under the following assumptions (Anderson, 2020):

20,000 LinkedIn impressions

With a budget of \$130.00 for LinkedIn advertising, at the cost of \$6.59 per 1,000 impressions and a click rate of 0.39%, we can expect up to 78 potential customers to visit our website through LinkedIn per month (Wilcox, 2020).

42,000 Google Ad Words impressions

Google Ad Words has an average click-through rate of 2% for \$2.80 per 1,000 impressions and clicks. We can expect 840 potential customers to visit our website, per month, with a budget of \$118.00 advertising with Google (AdStag, 2018).

1% Conversion rate

A 1% conversion rate is defined as a customer visiting our website from one of our advertising partners and creating a free-tier account.

85% of all accounts are free subscriptions

85% of accounts within Cereus's systems are anticipated to be of the free tier. Potential customers who engage with our advertisements and calls to action will create a free account before subscribing.

10% of all accounts are personal subscriptions

After customers evaluate our free tier, we estimate that 10% of all accounts in our systems will be the personal tier.

3% of all accounts are professional subscriptions

Professional subscriptions are expected to require product demonstrations. Companies that view our advertisements will visit our website, potentially create a free account, and reach out to our professional services staff to view our more advanced features. 3% of accounts are expected to be professional subscriptions.

Less than 2% of all accounts are enterprise and select subscriptions

Enterprise and Select subscriptions will require more than a free account evaluation to convince a customer to purchase our services. These customers will want a thorough walk-through of our products and see how we can assist their organization. Less than 2% of all our accounts will be of the enterprise and select tiers.

Table 5
Cereus sales forecast.

Tier	Monthly Subscriptions											
	1	2	3	4	5	6	7	8	9	10	11	12
Free	6	5	8	8	6	6	8	8	7	6	5	5
Personal	2	2	0	0	0	0	0	0	1	2	3	2
Professional	0	0	0	0	0	0	0	0	0	0	0	0
Enterprise	0	0	0	0	0	1	0	0	0	0	0	0
Customers	8	15	23	31	36	43	51	59	67	75	83	90
Revenue	\$73.28	\$146.66	\$145.86	\$145.06	\$144.46	\$1386.86	\$1386.06	\$1385.26	\$1421.50	\$1494.78	\$1605.10	\$1678.48

Operational Plan

Implementation Framework

As discussed in the Guiding Principles section, Cereus will follow the "Living Principles for Design" AIGA framework (Hamlett, 2020) to guide implementation efforts. It emphasizes that many of our operations along the interpersonal and cultural dimensions are limited to the transparency of our customers. Though we encourage our customers to share the information in our audits, we ultimately leave the decision to them.

Many of the criteria of AIGA along the environmental dimension don't often apply to a company offering software-as-a-service as we have no physical products. To minimize any environmental impact required by data storage, web hosting, networking, and data processing, we will rely on cloud services for our operations.

In the case of the economic dimension, Cereus aims to automate privacy compliance auditing for websites. This technological advancement will reduce the amount of time and resources required to conduct a privacy audit. We believe that this will allow our customers to focus and dedicate more resources towards achieving their goals and growing their business. Our overall economic impact is limited to the actions of our customers and is expected to be minimal.

Production

Cereus's founders will develop all software in-house using open-source tools, libraries, and frameworks. Strict quality control measures will be taken, including continuous integration, unit testing, integration testing, and code reviews. All code will be under source control and versioning.

One of the three founders will be in charge of all product development and management. The product manager will receive feedback from our customers and allocate work to the developers based. For each software development iteration (sprint), Cereus will deliver a minimum viable product for each feature designated by the product manager. Customer feedback will further shape how our product operates.

Location

Cereus will not lease or physically own any real estate. We offer software-as-a-service through a cloud provider. The founders will be able to contribute to the development of our products and services without any special equipment.

Physical correspondence to Cereus will operate through a PO Box.

Legal Environment

There are no regulations, zoning requirements, or permits required for Cereus to begin operations. Our crawler and auditor collects publicly available, non-personal, information that is not regulated by any legislation. For processing transactions, we partner with Authorize.net, which is audited yearly for PCI DSS compliance (Authorize.net, 2020). Customers under the General Data Protection Regulation request us, or to our credit processing partner to request that their information to retrieved or anonymized.

For system authorization, Cereus requires general information such as the user's email address, a password, and the user's name. We utilize modern security practices by encrypting our databases and hashing salted passwords – making it extremely difficult to exploit user information from our systems (Sriramya & Karthika, 2015).

All customers will be required to accept our general terms of use and a release of liability. Cereus, as an auditing company, can only provide insights and suggestions based on the configurations our customers have entered into our systems. We do not provide legal advice nor can we guarantee that our audits ensure our customer's websites meet regulations their websites are subjected to.

Personnel

For the first year, Cereus will consist of the three founders. The founders will not take a salary or dividends during the first year to allow the company to grow. This will limit initial funding costs and allow the founders to invest profits back into the company. Tasks will be allocated to the founders based on their expertise: data science, software engineering, product management, and marketing.

As discussed in the Administration Costs section, Cereus will allocate \$200 per month towards general accounting and customer account management. This will be handled by an outside firm.

Inventory

Cereus will not provide any physical products for distribution. Most products and services will be available immediately after purchase.

Suppliers

We partner with Amazon Web Services for all our infrastructure and data storage requirements. As a cloud provider, Amazon allows us to rapidly scale our systems based on customer needs with minimal costs and maintenance. Their Service Level Agreement requires that they make commercially reasonable efforts to achieve a monthly uptime percentage of at least 99.9% (Amazon, 2019). If Amazon falls short of this uptime percentage, we will be eligible to receive a service credit. As discussed in the Operational Costs section, Amazon's cost explorer allows us to conduct a monthly break-even analysis and forecast costs. With predictable billing from our cloud provider, we will be able to make adjustments to our budget and allocate funds as needed.

Cereus also partners with Authorize.net. Though generally more expensive than other credit processing companies, Authorize.net has a consistent 2.9% transaction fee plus \$0.30 (Wamala, 2019). The benefit of Authorize.net, in contrast to other credit card processors, is that it offers protection against chargebacks for \$25.00 per month – an anticipated issue with customers who subscribe before evaluating our services. Should an issuing bank rule in favor of our company, any associated chargeback fees will be refunded.

Credit Policies

In the Transaction Process section, we mentioned that Cereus will not offer credit to customers. Billing will be conducted every month. Customers will be required to enter billing information for all of our subscription tiers and allow the transaction to successfully process before gaining access to our services. Accounts becoming delinquent will result in our auditing services being disabled for the customer; this will mitigate Cereus incurring any additional costs associated with the account. Accounts delinquent for more than 30 days will result in the customer being locked out from our systems.

Management and Organization

As an S Corporation, Cereus is required to have a board of directors (UpCounsel, 2020). We are required to pay all employees a reasonable salary, have only one class of stock, have less than 100 shareholders, and all shareholders must be U.S. citizens or legal residents (Wave, 2019). Given that we do not anticipate hiring any employees during the first year of operations, the three founders will be required to manage all operations including support, sales, marketing, engineering, and product.

Professional and Advisory Support

Board of Directors

Initially, all company stock will be held by the three founders. The board of directors will consist of five people – including the three founders. The other two board members will be elected by the three founders identifying local leaders, preferably with experience in software development, marketing, privacy law, and/or data science. Should any board member be incapacitated or ask to be dismissed, the remaining board members will elect a replacement.

Attorney

As discussed in the Legal Environment section, Cereus will consult with an attorney to establish terms of use and release of liability contract to be used for all of our customers. We don't anticipate the need for a permanent attorney position during our first year of operations. As the company grows, our products expand, and legislation is passed or changed; the need for a full-time attorney may be justified.

Accountant

In the Administration Costs section, we established that accounting and account management will be managed by a third-party, with a budget of \$200 per month. Should the company grow and require a larger budget, the board of directors will consider hiring a part-time accountant during the first year of operations.

In the event the board determines the need for a part-time accountant, the new employee will be in charge of managing all company financial documents. Responsibilities will include: ensuring the accuracy of our financial documents, general financial reporting, and managing customer accounts.

The preparation of tax returns will be managed by an external firm.

Insurance Agent, Banker

During the first year of operations, Cereus does not anticipate a significant volume of work in the insurance or banking departments. These areas of work will be contracted to third-parties.

Mentors and Key Advisors

Cereus's primary mentors and key advisors will be local business owners and community leaders. Ideally, these entrepreneurs will be a part of our board of directors during the first year.

Expenses and Capitalization

Before releasing our products and services to the public, we will have to establish ourselves as an S Corporation in the state of Wisconsin and with the Internal Revenue Service. We will also have to implement our proposed products, infrastructure, and business rules.

The development and research time to implement a minimal-viable product of all our services we want to offer our customers could be considered expenses for our initial startup. To reduce the initial capital investment required to begin operations, at the cost of market presence, the founders have constructed all business processes and products described in the Description of Products and Services section.

Startup Expenses

- Marketing

A budget of \$250 per month to serve targeted advertisements on popular search engines and social media platforms (Administration Costs).

- Accounting

Up to \$200 per month to general accounting operations will be budgeted (Administration Costs).

- Incorporation

To assist with establishing Cereus as an S Corporation, we will contract an agency to incorporate our business. LegalZoom will charge \$149 plus any state filing fees to file the required documents (LegalZoom, n.d.). The Wisconsin incorporation filing fee is \$40 (Wisconsin Department of Revenue, 2018).

- Contingencies

During our first year of operations, we will reserve an additional 10% of known expenses, as recommended by the SBA, to account for any potential fluctuations in the budget and/or unknowns (U.S. Small Business Administration, 2020).

Including the infrastructure costs of \$157.14 (Infrastructure Costs) for initial testing and debugging, our startup expenses will be around \$875.75.

Capitalization

Cereus's three founders will make an initial investment of \$8,500.00 to cover a year's worth of known expenses, start-up costs, and contingencies. This will allow our company to actively monitor up to 100 websites until it's cash-positive – 17 personal subscriptions (Table 4).

Financial Plan

Assumptions

Cereus's financial plan is based on the operational costs described in the Administration Costs section. Forecasted sales for our first year can be found in Table 5 and start-up expenses in the Startup Expenses section. Supplier billing takes place every 30 days (Infrastructure Costs) and customers are billed the first of each month (Transaction Process).

Revenue Assumptions

Total revenue, including costs associated with operating each tier, is projected to be \$11,013.36 during our first year of operations (Table 5). This is under the assumption that our marketing campaigns have a 1% conversion rate and that all assumptions in the Sales Forecast section are met.

Financing

Cereus's three founders will make an initial investment of \$8,500.00 to cover a year's worth of known expenses, start-up costs, and contingencies.

Startup Expenses

Our startup budget, including a 10% contingency budget, is estimated to be \$875.75 (Startup Expenses).

Operational Expense Assumptions

General infrastructure operations, for auditing up to 100 websites, is expected to be around \$157.14 per month (Infrastructure Costs). We will budget \$250 per month for advertising and promotion (Administration Costs). Up to \$200 per month will be reserved for general accounting purposes (Administration Costs).

We anticipate our operating expenses to be around \$607.14 per month.

Profit and Loss Projection

Cereus's yearly profit loss and projection for the first year is provided in Table 6. As an S Corporation, tax responsibilities fall to our shareholders (the founders) and are not reflected in the table (Legal Form of Ownership).

Using the forecasted sales of each subscription, the cost associated with each subscription, and estimated operation expenses, Table 6 reveals that it make take up to six months before Cereus is profitable.

Cash-Flow Projection

So long as Cereus has at least one personal tier subscriber during the first year and an initial contribution of \$8,500.00 is made by the founders, the company will be cash-positive (though not profitable). Given the forecasted sales in Table 5, Cereus will be profitable within six months and have a cash balance of \$11,354.00 by the end of the year (Table 7).

Opening Day Balance Sheet

Cereus will not have any inventory, pre-paid expenses, equipment, liabilities, or real estate. Assets on opening day will be equal to the investor's initiate contribution with start-up, accounting, and marketing expenses deducted. On opening day, Cereus will have \$7,174.25 in assets – solely cash.

Break-Even Analysis

Table 4 calculates the number of subscriptions from each tier, including the cost to run each subscription, to break even with an infrastructure to support the auditing of up to 100 websites. This can be any mix of our subscription tiers, but at minimum, we will require any of the following: 17 personal subscriptions, 7 personal subscriptions, or 1 enterprise subscription.

Table 6
Monthly Profit and Loss Projection.

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Subscription Revenue												
Personal	78.00	156.00	156.00	156.00	156.00	156.00	156.00	156.00	195.00	273.00	390.00	468.00
Professional												
Enterprise						1299.00	1299.00	1299.00	1299.00	1299.00	1299.00	1299.00
Total	78.00	156.00	156.00	156.00	156.00	1455.00	1455.00	1455.00	1494.00	1572.00	1689.00	1767.00
Costs of Goods Sold												
Free	0.60	1.10	1.90	2.70	3.30	3.90	4.70	5.50	6.20	6.80	7.30	7.80
Personal	4.12	8.24	8.24	8.24	8.24	8.24	8.24	8.24	10.30	14.42	20.06	24.18
Professional												
Enterprise						55.86	55.86	55.86	55.86	55.86	55.86	55.86
Total	4.72	9.34	10.14	10.94	11.54	68.00	68.80	69.60	72.36	77.08	83.22	87.84
Operating Expenses	607.14	607.14	607.14	607.14	607.14	607.14	607.14	607.14	607.14	607.14	607.14	607.14
Net Income/Loss	-533.86	-460.48	-461.28	-462.08	-462.68	779.86	779.06	778.26	814.50	887.78	998.64	1072.02

Table 7
Monthly cash flow.

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Ingress												
Subscriptions	78.00	156.00	156.00	156.00	156.00	1455.00	1455.00	1455.00	1494.00	1572.00	1689.00	1767.00
Financing	8500.00											
Egress												
Operations	157.14	157.14	157.14	157.14	157.14	157.14	157.14	157.14	157.14	157.14	157.14	157.14
Marketing	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
Accounting	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
Infrastructure	4.72	9.34	10.14	10.94	11.54	68.00	68.80	69.60	72.36	77.08	83.22	87.84
Startup	875.75											
Totals												
Total Cash Flow	7090.39	-460.48	-461.28	-462.08	-462.68	779.86	779.06	778.26	814.50	887.78	998.64	1072.02
Beginning Cash	0.00	7090.39	6629.91	6168.63	5706.55	5243.87	6023.73	6802.79	7581.05	8395.55	9283.33	10281.98
Ending Cash	7090.39	6629.91	6168.63	5706.55	5243.87	6023.73	6802.79	7581.05	8395.55	9283.33	10281.98	11354.00

Next Steps

Our business plan is best treated as a living document. As time progresses, the industry changes and our company grows; our business plan will adapt. Aspects of our company, such as our infrastructure costs and marketing strategy, are expected to change frequently. Other components, such as our mission and objectives, will remain relatively the same. Products and services will always respond to customer feedback and legislation changes, but the demand for these changes is currently unknown.

Situation

All of our expenses, revenues, and projections are informed estimates. Based on these estimates and projections, it is reasonable to believe that our company will be profitable within the first year – so long as marketing operations are successful. These are, however, only estimates and may not represent our observations over time. Should there be a significant difference between our projections and observations, we will refine our business plan to achieve our goal of being profitable within the first year.

Target

Our primary target is to be profitable within the first year. Other key metrics include the number of paid subscriptions, the number of audits conducted each month, the number of websites being actively monitored within our system, and the total number of website pages we audit. Ideally, we would have at least 17 personal subscriptions auditing 85 pages once a month – this will, at least, allow us to break even the first year.

Proposal

Our path to achieving our goals will rely heavily on our marketing strategy and demonstrations. The more customers we acquire, the more likely we'll be able to support and improve our ventures. Though we have well-informed projections on our operational costs and sales, these may not be accurate. Should this be the case, we will have to alter our strategies and potentially seek outside investment.

Conclusion

The purpose of this research was to determine the feasibility of founding a privacy company that provides automated auditing services. Over the past ten years, I've implemented dozens of consent management platforms for hundreds of websites. After conducting several audits, I began to notice that many of my practices could be automated. Initially, I developed general tools to assist me with day-to-day operations. Over time, these tools became the products discussed in this business plan.

The proposed company, Cereus, is a software-as-a-service company offering privacy compliance auditing tools and solutions for businesses that collect customer information through their websites. We will ensure that a website, and any new features, meet the compliance standards customers have defined within our systems before deployments reach their users. This enables companies to communicate with their partners in an efficient, compliant way – allowing our customers to focus on developing their products for their audience.

Sales forecasts for each month were simulated for the first year. Assumptions, as discussed in the Sales Forecast Section, were made to estimate the conversion rate for our digital marketing campaigns. A percentage of the conversion rate, based on our open beta subscriptions, was applied to determine how many customers would subscribe to each tier. The simulation identified that Cereus has the potential to be profitable after 6 months of operations (Table 6).

The next steps involve the establishment of the board of directors, registration of the company, formulation of our marketing campaign, and the launch of our website. Customer feedback from our beta phase will be reviewed to determine which features will be required for our official release, and which will be included in future releases. An accounting agency will also have to be hired.

Lastly, this business plan is a living document. As the company grows, markets fluctuate, and the industry changes; the business plan will adapt. We will, initially, offer automated privacy auditing tools for our customers. Should our auditing tools prove to be successful in the privacy software market, we will aim to expand our services to be a consent management provider.

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