THE FEASIBILITY STUDY ON EXISTING INTERNATIONAL AND NATIONAL GREEN CERTIFICATION DIGITAL PLATFORMS

Ulaanbaatar 2023

Table of Contents

Acronyms

API	Application Programming Interface (Interface-contract of service between two applications. This contract defines how the two communicate with each other using requests and responses)
BREAAM	Building Research Establishment Environmental Assessment Methodology
ESG	Environmental, Social and Governance
GHG	Greenhouse Gases
GoM	Government of Mongolia
GOTS	Global Organic Textile Standard
IFOAM	International Federation of Organic Agriculture Movement
ISO	International Organization for Standardization
KEITI	Korean Environmental Industry and Technology Institute
MET	Ministry of Environment and Tourism
MSMEs	Micro, Small and Medium Enterprises
LEED	Leadership in Energy and Environmental Design
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific

Executive summary

Although Mongolia observes the gradual growth in agri-food and beverage, the sector's overall operation presents negative effects leading to climate change. The country is responsible for barely 0.12% of the total GHG emission globally[1], however, the country's per capita GHG emission is higher than the world average. Moreover, the agriculture sector itself is a heavy GHG contributor by releasing ⅓ of the total emissions in the world. This brings an urgent need for the country to act on becoming sustainable and aim to reduce the per capita emission. Compared to the digital transformation and innovative infrastructure in various sectors of Mongolia, traditional sectors, such as agriculture, are lagging and leaving a potential to adapt technology as a resource to develop and pathways to introduce practical solutions and standards to farmers and other stakeholders of the food industry. It is significant for the value chain participants to realize the environmental and social effects of their own and take continuous actions to resolve any related issues of the production. Thus, to improve the sector's productivity, it is necessary to develop a well-aligned green certification digital platform and introduce it to all sizes of businesses. Micro, small, and medium-sized enterprises (MSMEs) constantly play an important role in the food supply chain and should be prioritized when adopting the relative standards. By leveraging digital tools, green certification bodies can make the certification process more efficient, reduce the environmental impact of the certification process, and increase the adoption of sustainable practices. As the demand for sustainable products and practices continues to grow, green certification digital platforms will likely become even more important in the years to come. The adoption of green certification platforms and the ongoing technological development of these platforms are vital to satisfying the sustainability demands of today's consumers as the food and beverage sector continues to face increased pressure to solve sustainability concerns. Green certification schemes are positioned to play a key role in boosting the operation of food and beverage producers more sustainably and responsibly as the demand for sustainable products continues to rise. This report presents the main findings of the feasibility study on existing national

[1] https://climatepromise.undp.org/what-we-do/where-we-work/mongolia

and international green certification digital platforms, and the last section lists the recommendation for development.

Key findings

In this report, the green platforms from Europe and Asia region in the sector of food and agriculture as well as building were studied. Both regions ecolabel digital platforms have similarity of user-friendly, time-saving, transparent, cost effective, convenient and accessible to businesses of all kinds, though the platform's usability may vary depending on the experience and preferences of each user. Moreover, the platforms provide a variety of resources and tools, such as step-by-step instructions, FAQ sections, and contact details for the pertinent Verification Body, to assist companies with the certification process. For instance, the most prominent green certification is a voluntary EU Ecolabel, and it certifies goods and services that meet high environmental standards throughout their entire value chain, from raw materials to their production, processing, and distribution to market. EU Ecolabel confirms that the products are produced under the condition of low environmental impact. It also encourages companies to develop innovative products that are durable, easy to repair, and recyclable. The application for the EU Ecolabel is quite simple and easy to follow. The companies can submit the application as a manufacturer, importer, service provider, wholesaler, or retailer. First, the applicant should see the certification checklist and ascertain if the company or its product is capable for applying and obtaining certification. If yes, the entity can start the process through website named RAL (the system has actively been used in Germany). The company in charge of running the EcoLabel digital infrastructure and managing the EU Ecolabel in Germany is called RAL (Deutsches Institut für Gütesicherung und Kennzeichnung e.V.). Whereas Singapore Green Plan 2030 is a green certification scheme introduced by the Singapore government that aims to promote sustainable practices in different sectors, including food and beverage. The certification encourages businesses to reduce their carbon footprint and adopt sustainable production methods. The Eco F&B is an online certification platform that assesses the environmental management system of a food establishment operating in Singapore. It facilitates the adoption of environmentally sustainable practices by addressing the establishment's environmental policies, air quality, as well as its water, energy, and waste management.[2] Eco F&B certified businesses or products enjoy the benefits of gaining consumers' attraction, using the eco-certification credentials on their name cards, paper bags, shop fronts, and marketing materials.

Compared to Asian and European countries, Mongolia is at an early stage of implementing a digital platform for green certification in the food and beverage sectors. Green certification digital platforms typically include tools for calculating environmental metrics such as carbon emissions, energy usage, water consumption, and waste generation. They also offer reporting systems that

[2] https://www.sec.org.sg/eco-certifications.html

allow businesses to share their sustainability data with stakeholders and often provide guidance and resources for developing sustainability goals and strategies. Many green certification platforms also offer recognizable symbols of sustainability, such as logos or certification marks, which businesses can use on their products and marketing materials to communicate their commitment to sustainability to consumers. A digital platform for green certification should be developed user friendly to access the stakeholders. The user-friendliness of these platforms is critical, as they need to be intuitive and accessible to businesses of all sizes and levels of technical expertise. To meet this requirement, many green certification platforms are designed with user-friendly interfaces and easy-to-understand reporting systems that allow businesses to track their sustainability performance quickly and easily over time.

The following are the main conclusions on appropriate IT advances for digital platforms that seek green certification:

- ★ The certification process could become more effective and accurate with the help of automation and digitization of data collecting, analysis, and reporting.
- ★ Many digital platforms for green certification leverage APIs and other data integration technologies as a core component, enabling more precise and effective data collecting and analysis.
- ★ Utilizing blockchain technology can improve supply chain traceability and transparency, which is crucial for verifying sustainability claims.
- ★ Artificial intelligence and machine learning can be used to find patterns and insights in data, which can be used to identify future sustainability problems and guide decision-making.
- ★ Inaccessible or remote regions, mobile technologies can aid in data collecting and verification.
- ★ A centralized and accessible location for data storage and analysis can be offered via cloud-based technologies.
- ★ Digital platforms for green certification come in a wide range of scopes, costs, and usability.
- ★ To qualify for certification, SMEs must gather a variety of documents and data, such as financial records and proof of eco-transition.
- ★ Platforms for green certification try to stop "greenwashing" by using external validators and requiring ongoing audits and data updates.
- ★ Depending on the features and extent of the digital platform for green certification, the cost to design and maintain it can vary greatly.

Depending on the requirements and objectives of the certification digital platforms, the key characteristics may differ. However, some crucial elements that can be useful for SOGE digital platform for green certification include

I. The digital platform should have a user-friendly layout. It means users should be able to easily explore the platform and find clear instructions there.
II. Management and analysis of data pertaining to environmental performance (as required in the scheme criteria) should be possible to see on the platform. This information can be used to pinpoint areas that need to be improved to satisfy certification requirements.
III. Automated data collection and real-time monitoring of performance can speed up the certification procedure and supply accurate, current information.
IV. The platform should present information about the certification procedure that is open and traceable, including the standards used for evaluation, the status of each product's certification, and any certifications that have been revoked or suspended.
V. The platform should be usable on mobile devices, which is useful for certification-seeking businesses that might not have access to a desktop computer.
VI. Tools that promote collaboration and communication between organizations pursuing certification and certification bodies should be available on the platform. This can include file-sharing options, messaging services, and chat functions.
VII. To guarantee consistent and accurate information about certified products and organizations, the platform should be able to connect with other digital platforms, such as e-commerce websites or supply chain management systems.

Overall, green certification digital platforms offer user-friendly features and functions, such as online audit tools, collecting, monitoring, and reporting data, providing guidance and resource tools, and allowing producers to utilize recognizable symbols or marks, which can help businesses to communicate their commitment to consumers on the market. However, the adoption of green certification digital platforms in Mongolia could still be limited depending on various factors, including a lack of infrastructure, limited access to digital devices and internet services, and local users' level of digital literacy. Fortunately, the effort of GoM, other private entities, and international organizations to promote sustainable development and digital infrastructure could create opportunities for the adoption of such digital solutions in the future.

Section 1. Background and overview

A green certification digital platform is an online compliance scheme that verifies and then certifies that a product or an organization meets certain environmental, social, and governance (ESG) sustainability standards. The ESG standards can cover a wide range of aspects such as energy efficiency, water conservation, waste recycling and reduction, and the use of environmentally friendly materials. Even though Mongolia's agri-food and beverage sector is gradually expanding, its operation has detrimental impacts that contribute to climate change. It contributes to the main greenhouse gases (GHG) released by human activity, such as carbon dioxide, methane & nitrous oxide, as well as fluorinated gases used for cooling and refrigeration. These man-made actions in the industrial age, and particularly during the last century, are significantly altering our planet's climate through the release of harmful GHG. Mongolia is responsible for barely 0.12% of the total GHG emission globally[3], however, the nation's per-capita emissions are greater than the global average, and the agricultural sector, which accounts for one-third of global emissions, could significantly contributes to the nation's emissions. To improve Mongolia's sustainability and lower its per individual emissions, immediate action is required given the current circumstances. Traditional industries like agriculture are falling behind in Mongolia despite the digital transformation and innovative infrastructure in many different other sectors, and it is necessary to use technology as a resource for growth. This might offer farmers and other food business participants useful guidelines and standards.

The objective of this study is to map out international and national green certification digital platforms recently in-use including their pros and cons, operation flows, lessons learned, and to prepare a comprehensible design plan recommended for Mongolia's context leveraging the research outcomes.

The sustainability schemes are not sufficiently put into practice among players in the food and beverage sector. It is significant for the value chain participants to realize the environmental and social effects of their own and take continuous actions to resolve any related issues of the production. Thus, to improve the sector's productivity, it is necessary to develop a well-aligned green certification digital platform and introduce it to all sizes of businesses. Micro, small, and medium-sized enterprises (MSMEs) constantly play an important role in the food supply chain and should be prioritized when adopting the relative standards. Green certification digital platform will be a key to Mongolia's agriculture, food, and beverage sector to ensure food safety, to enhance market access, to promote sustainable practices and to reduce GHG emissions.

There are recognized somehow sustainability related certifications are serving in Mongolia namely Organic Food, Good Agricultural Practice (GAP), the Global G.A.P, the Hazard Analysis and Critical Control Points (HACCP), and ISO standards. Unfortunately, all above-mentioned

[3] https://climatepromise.undp.org/what-we-do/where-we-work/mongolia

certification processes are still administered under the traditional, paper-based standard operating procedures which involve several phases of a long complex physical process. By obtaining green certification, producers and MSMEs can improve their competitiveness in the local and global market, enhance their reputation, and contribute to a sustainable future for the country. Most importantly, the process of obtaining a green certification should be easy, digitized, innovative, and time saving to improve entire efficiency.

Currently, there are few international green certifications digital (usually web-based) platforms such as Global Organic Textile Standard (GOTS),Rainforest Alliance, Forest Stewardship Council (FCS) and ISO environmental management standards, available for businesses to apply from Mongolia, and most of these certification's platforms are focused on specific products or industries. For example, the Global Organic Textile Standard (GOTS), which provides certification for organic textiles, has a web-based platform that allows Mongolian businesses to submit their products for certification.

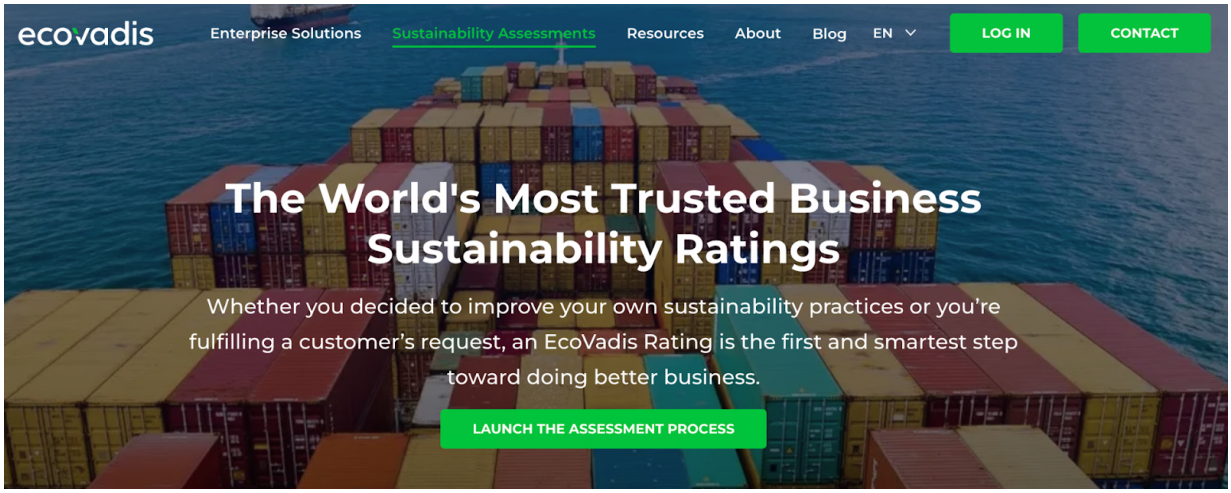
1.1. General context on green certification digital platforms

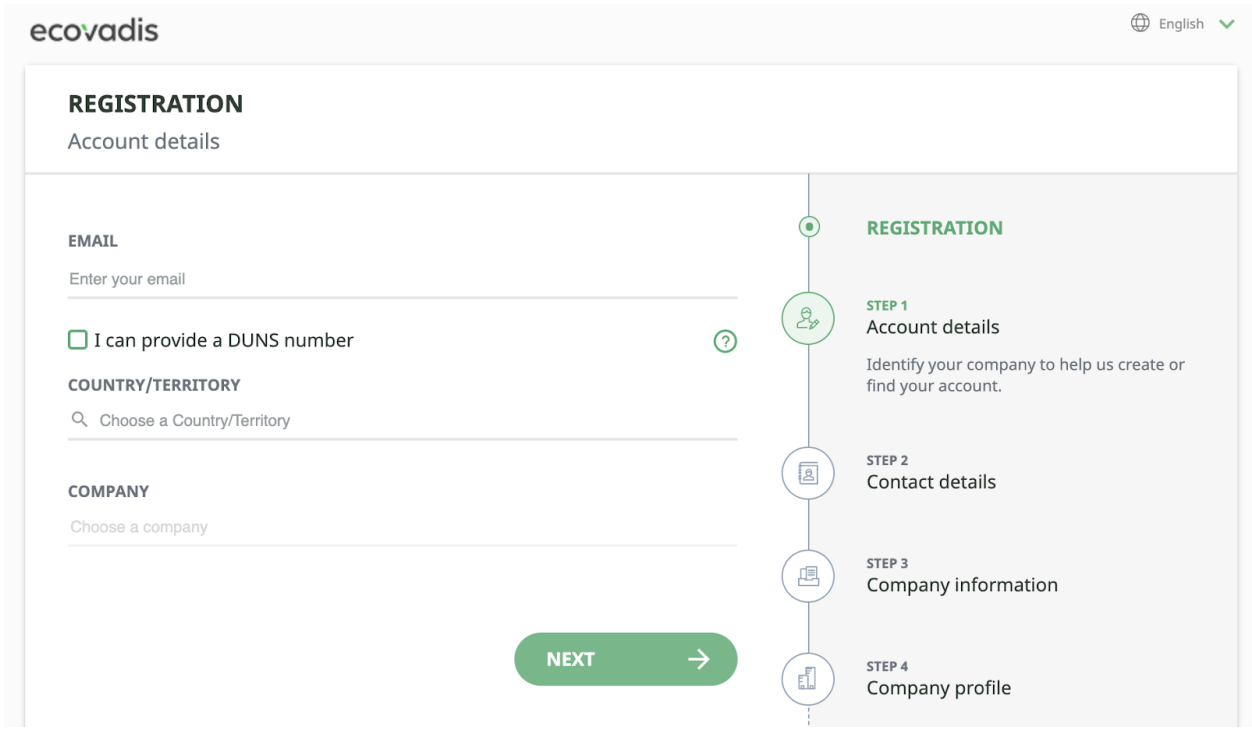
Green businesses can serve well in the best interest of the local and global environment supporting the community and economy to contribute to a healthy planet. Environmentally and socially aware businesses consider more than just the profits - they consider its impact on humans and the earth. Going green has several benefits for businesses including cutting costs, improving efficiency, and creating healthier workplaces. Less tangible benefits can be boosting brand reputation and customer loyalty, and employees' morale.

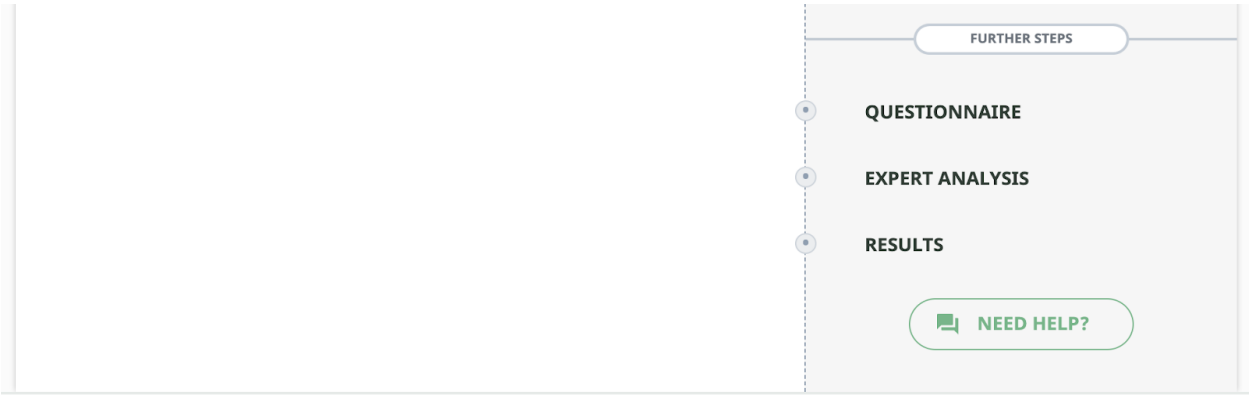
Green certification bodies certify companies managing sustainable practices, products, or services. Green certification bodies reach out to a wide range of sectors, including agriculture, food and beverage, construction, textiles, energy, and so on. They certify, and award companies that comply with scheme criteria for sustainable practices, and those companies are allowed to use the logos/labels to promote their products or services produced in an environmentally and socially friendly manner.

Green certification digital platforms facilitate the process of certification of products or services. Certification processes differ depending on the scheme and sector. Typically, the certification process involves an audit conducted by an accredited third-party entity or certified experts to verify that the entity meets the scheme criteria set by the respective public or private organizations aligned with related regulations. The audit may include on-site inspections, document reviews, and interviews with staff. Digital platforms can use a variety of tools and technologies to provide certification services, such as data analytics, blockchain technology, and artificial intelligence. The platform can also provide a range of features to help businesses and organizations to manage and

track their sustainability performance over time, such as sustainability reporting, benchmarking, and goal setting. Examples of green certification digital platforms include EcoVadis (French company www.ecovadis.com), which provides sustainability ratings for companies across a range of industries, and the Global Reporting Initiatives (GRI), which provides standards and guidelines for sustainability reporting.







Within the framework of the SOGE project, green certification in the form of a green/eco-labeling digital platform will be developed and launched among producers for product and entity levels in the food and beverage sector. The project team aims to support 10,000 local micro, small and medium-sized enterprises, and service providers (MSMEs) and 750 retailers by introducing them to the circular economy practices, providing them with the necessary knowledge, capabilities, and opportunities, as well as connecting them with green financing, making their operations more environmentally friendly, safe to natural resources. The certification process can be done efficiently through the digital certification system, namely with a website or mobile app.

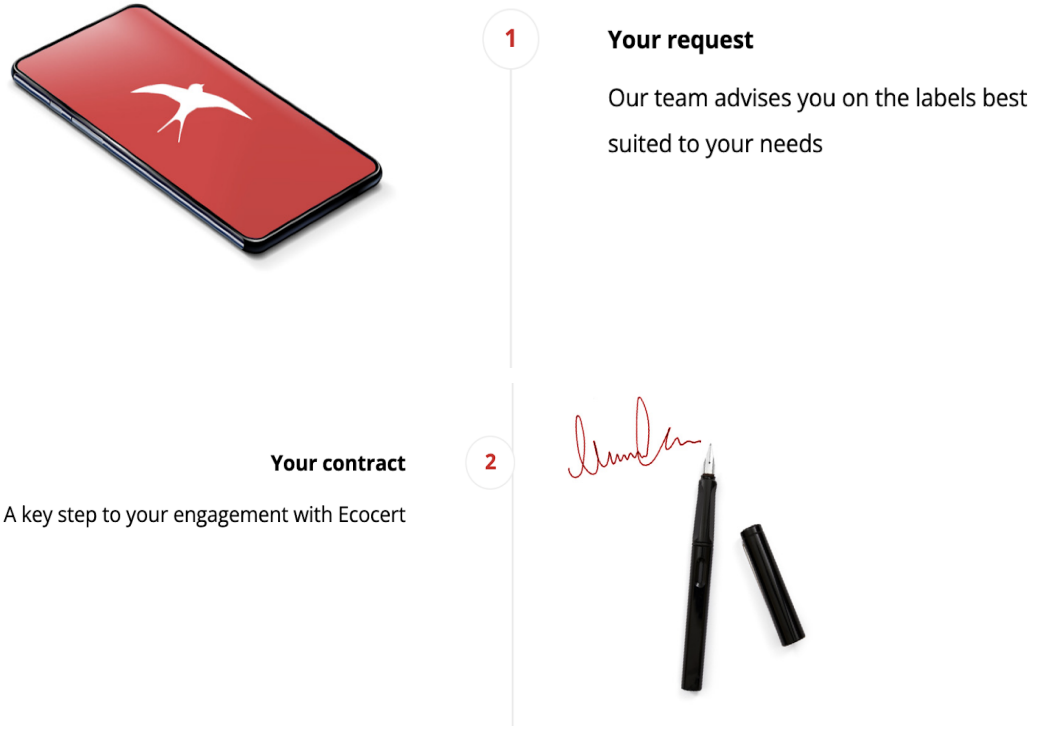
Digital platforms for green certification can help entities get certified for their goods or services by streamlining the process of evaluating and validating their governance, social, and environmental performance. These platforms frequently provide a variety of tools and services to assist firms in demonstrating compliance with ESG standards and laws, such as:

1. Certification assessment: Several green certification digital platforms offer standardized assessment procedures that gauge the environmental impact of a good, service, or entity. These analyses frequently consider energy use, water use, waste management, and GHG emissions.
2. Environmental standards: Green certification digital platforms leverage established environmental standards and certifications, such as ISO 14001[4] Leadership in Energy and Environmental Design[5] (LEED), to demonstrate an organization's commitment to environmental management.
3. Data collection and reporting: The digital platforms frequently offer resources for gathering and evaluating information on the environmental performance of a good or service, which can be used to monitor development and enhance sustainability practices over time.

[4] **ISO 14001 is the most recognised standard to demonstrate an organisation's commitment to environmental management and is considered one of the most effective ways to manage environmental impacts.**
[5] LEED (Leadership in Energy and Environmental Design) is a certification created in 1993 by the United States Green Building Council, known as USGBC, which aims to measure the environmental performance of a building, promoting sustainable design and construction methods.

4. Certification logos and labels: Following certification issuance, digital platforms may offer logos or labels that can be printed and displayed on the packaging and used as marketing materials, notifying consumers that the product or service has been credibly certified for safety and sustainability.

Examples of green certification digital platforms that offer certification services include EcoCert (www.ecocert.com), which provides organic and environmental certifications for products and services. The issued certifications guarantee and highlight the best environmentally friendly and socially conscious practices. The most requested certifications through this web-based platform include European Ecolabel, Organic Agriculture USA, Organic Agriculture Europe, Fairtrade, Organic Agriculture Japan, and Organic and Natural Cosmetics. As it has been explained on their website, Ecocert's certification process goes into 5 key steps:



3

Initial audit

Our auditors make on-site visits to check the compliance of your systems, your practices and your products with the corresponding standards.

Review of your certification file

Our certification officers review the conclusions of the audit report to decide if certification may be granted

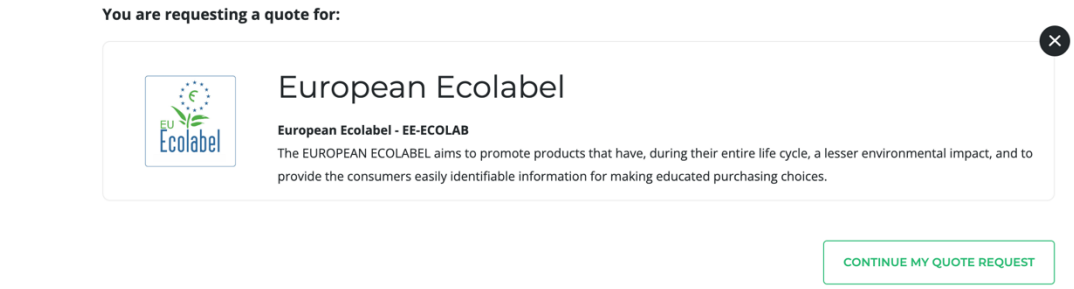
4

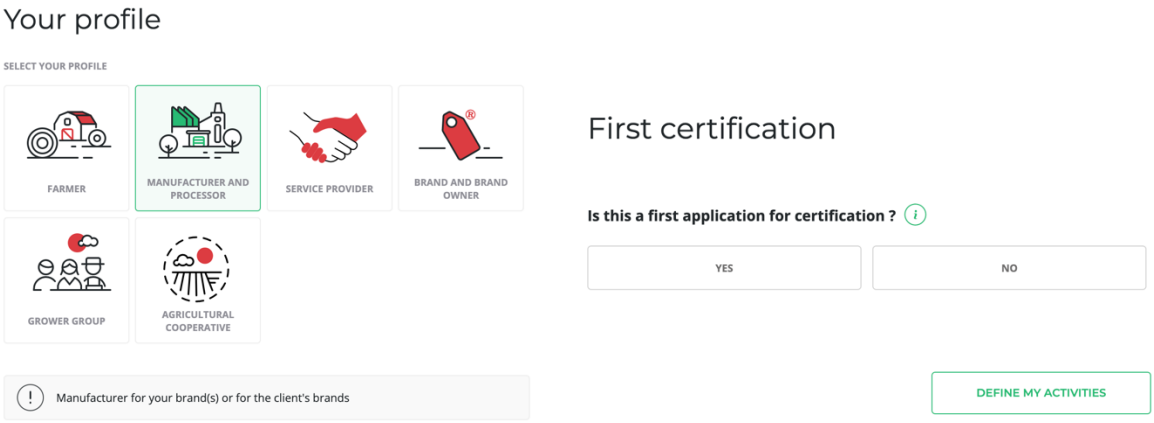
5

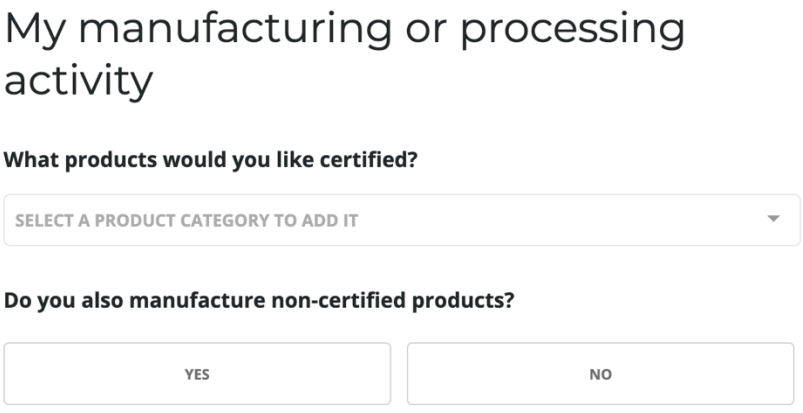
Certification

Our team has issued your certificate. At this point, you can display the logo associated with the standard on your labels with a transparent communication.

To provide more ideas how it works the consultant team asked the price quota for the EU Ecolabel and JAS certifications. The steps of asking the prices quota follows as:


You are requesting a quote for:
European Ecolabel
European Ecolabel - EE-ECOLAB
The EUROPEAN ECOLABEL aims to promote products that have, during their entire life cycle, a lesser environmental impact, and to provide the consumers easily identifiable information for making educated purchasing choices.
CONTINUE MY QUOTE REQUEST


Your profile
SELECT YOUR PROFILE
FARMER
MANUFACTURER AND PROCESSOR
SERVICE PROVIDER
BRAND AND BRAND OWNER
GROWER GROUP
AGRICULTURAL COOPERATIVE
Manufacturer for your brand(s) or for the client's brands
First certification
Is this a first application for certification ?
YES
NO
DEFINE MY ACTIVITIES


My manufacturing or processing activity
What products would you like certified?
SELECT A PRODUCT CATEGORY TO ADD IT
Do you also manufacture non-certified products?
YES
NO

Your contact details

TITLE

FIRST NAME

First name

SURNAME

Surname

EMAIL

Email

PHONE

Phone

Suppliers

How many raw material suppliers do you have?

NUMBER OF RAW MATERIAL SUPPLIERS

2

Do you import certified processed products or raw materials?

YES | NO

Multisite and remote sites

Will your certified activity apply to several sites (excluding provider and subcontractor)?

YES | NO

PLANT 1

IN WHICH CITY IS THIS PLANT LOCATED?

CITY

Ulaanbaatar

COUNTRY

Mongolia

WHICH ACTIVITIES MUST BE CERTIFIED IN THIS PLANT ?

ADMINISTRATIVE | PREPACKAGED STORAGE

MANUFACTURING OR PROCESSING | BULK STORAGE

PLANT 2

IN WHICH CITY IS THIS PLANT LOCATED?

CITY

Mungunmorit, Mongolia

COUNTRY

Mongolia

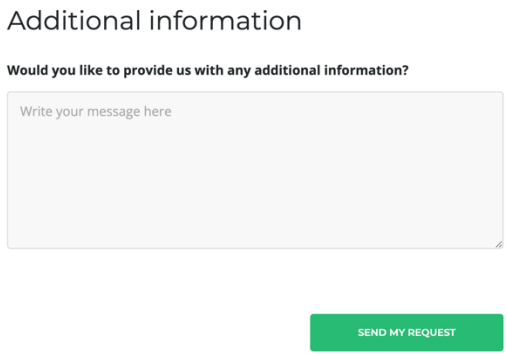
WHICH ACTIVITIES MUST BE CERTIFIED IN THIS PLANT ?

ADMINISTRATIVE | PREPACKAGED STORAGE

MANUFACTURING OR PROCESSING | BULK STORAGE

CONDITIONING | SLAUGHTER

MEAT CUTTING | LABELING



EcoCert's financial model is based on few different revenue streams. Fees for certification vary based on the type and complexity of the certification and are assessed by ECOCERT. The services provided by EcoCert includes:

- Inspection fees - As part of the certification procedure, ECOCERT conducts inspections.
- Payment for instruction - ECOCERT provides training programs and levies fees for these services.
- Fees for consulting - ECOCERT provides counseling services to companies looking to become certified or who want to advance their sustainability efforts.
- Fees for label registration - ECOCERT charges fee for the use of their labels on organic and sustainable products.
- Membership costs - ECOCERT charges membership costs for its business and organization membership initiatives.
- Sales of standards and recommendations - ECOCERT offers books that contain data on organic and sustainable standards and recommendations.
- Grant funding - To support its efforts to promote organic and sustainable practices, ECOCERT gets grants from government agencies, non-profit organizations, and other organizations.

Overall, ECOCERT's business model is built on offering companies looking to enhance their sustainability practices certification services, training, consulting, and other value-added services. ECOCERT has become a well-respected certifying body for organic and sustainable products by expanding its sources of income and providing a variety of services. Overall, the cost of EcoCert

services differs according to the requirements of the entity applying for certification. It is advised that companies interested in EcoCert's certification services get in touch with the company directly to receive a tailored quotation.
In general, to make the certification process more efficient and accessible, many certification bodies today are turning to digital processes, and here are some ways that green certification can be done digitally:

1. Online application: green certification organizations may offer online application forms that let users submit their digital certification application materials. The submission may be done through a website or mobile app, or both. By doing so, the application process is accelerated and the necessity for paper-based procedures is diminished.

2. Digital audit: By using digital tools, certifying bodies can perform audits remotely. This can involve online document inspections, virtual tours, and video conferences. As a result, physical audits are no longer necessary, and the procedure is now more effective.

3. Digital book record: green certification bodies may store all certification records digitally thanks to digital record-keeping tools. Applications, audit findings, and certificates fall under this category. As a result, there is a lessened demand for physical storage space, and remote access to records is made simpler.

4. Automatic verification: To ensure that the applicant's information is accurate, certification bodies can employ automated verification methods. This may involve automatically calculating environmental effect measures like energy use or carbon footprint.

5. Digital badge: Scheme owners that offer green certification can produce badges that can be shown on a website, mobile app dashboard, or social media platform. This facilitates the use of sustainable practices and makes it simpler for customers to recognize certified goods or services.

By leveraging digital tools, certification bodies can make the certification process more efficient, reduce the environmental impact of the certification process, and increase the adoption of sustainable practices. As the demand for sustainable products and practices continues to grow, green certification digital platforms will likely become even more important in the years to come.

1.2. Mongolia's familiarity with the green certification digital platforms

In November 2017, a workshop called 'Accelerating sustainable development through green finance: green certification and eco-labeling took place in partnership with the Ministry of Environment and Tourism (MET), UNESCAP, the Ministry of Environment of the Republic of Korea, and the Korean Environmental Industry and Technology Institute (KEITI). During this workshop, participants thoroughly discussed the green development policy to progress Mongolia's sustainable development and its mechanisms of implementation. The MET specialists back then presented Mongolia's green development policy. A representative from the UNESCAP presented about the state of Mongolia's sustainable development, review, and procession of documentation[6]. Also, KEITI specialists shared their lessons-learned perspectives in launching green financing and green certification system. Since then, the country has been making efforts to digitalize the relative activities but has not tangibly succeeded in building an effective green certification digital platform.

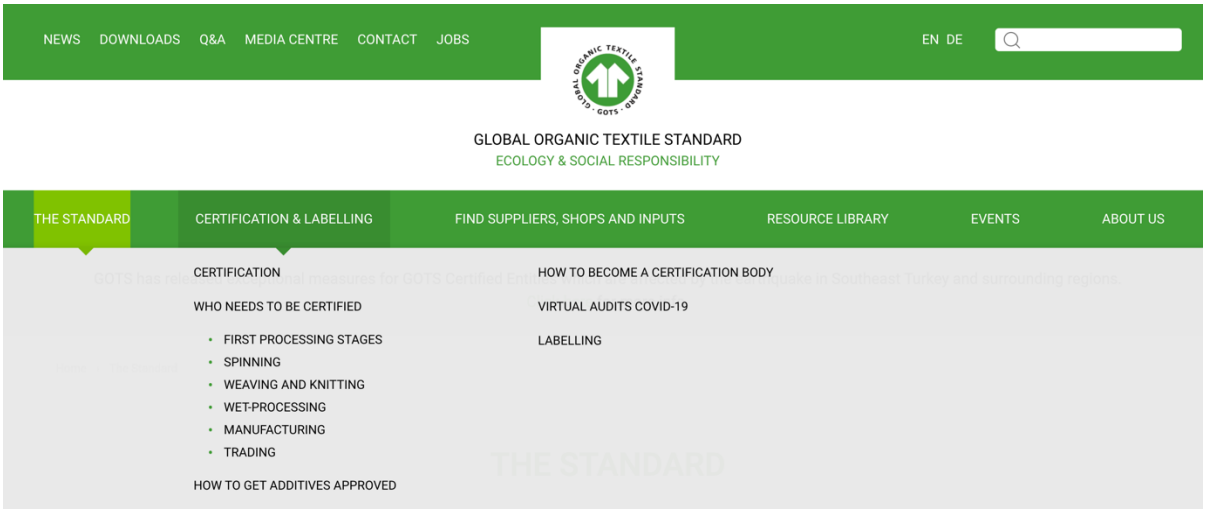
Mongolia is still a developing country, and its familiarity with green certification digital platforms is limited as the adoption of new technologies is still in the early stages. However, in recent years, the government of Mongolia has been promoting the development of digital infrastructure and technology, which could efficiently facilitate the adoption of the green certification system in the long run. In addition, there has been an increasingly public and private sector interest in sustainable practices and environmental protection, and green certification digital platforms are starting to gain huge interest and acceptance. In the food and beverage sector, there have been already introduced certifications with green criteria for farms that run under the othat rganic way or farms adopted Good Agricultural Practices (GAP). The products with organic or GAP labels are already reached to consumers. While these certifications guarantee that the production met certain food safety and quality standards with respect to environmental good practices and labor safety, the entire process of obtaining certification runs manually.

Currently, there are few international green certifications digital (usually web-based) platforms available for businesses to apply from Mongolia, and most of these certification platforms are focused on specific products or industries. To name some of these platforms:

1. Global Organic Textile Standard (GOTS)
2. Rainforest Alliance
3. Forest Stewardship Council (FCS)
4. ISO environmental management standards

For example, the Global Organic Textile Standard (GOTS), which provides certification for organic textiles, has a web-based platform that allows Mongolian businesses to submit their products for certification.

[6] https://montsame.mn/en/read/132489



The GOTS logo can only be applied to the final product if all stages comply with the GOTS criteria. Therefore, all processors, manufacturers, and traders of textiles need to be certified. Businesses seeking to GOTS verification can log into their website (https://global-standard.org/certification-and-labelling/who-needs-to-be-certified) and start the certification process so on.

The adoption of green certification digital platforms in Mongolia could still be limited dependent on various factors, including a lack of infrastructure, limited access to digital devices and internet services, and local users' level of digital literacy. Fortunately, the effort of GoM, other private

entities, and international organizations to promote sustainable development and digital infrastructure could create opportunities for the adoption of such digital solutions in the future.

1.3. Familiarity of the EU and Asia with the green certification platforms

As society is changing, individuals are now more than ever questioning how and where the products they buy come from and what impacts their purchases show to the social and environmental impacts. As per a Unilever study conducted in five countries such as the UK, US, Brazil, Turkey, and India, one-third out of 20,000 consumers choose brands based on their social and environmental impact.

The European Commission also discovered that 94% of Europeans believe that their personal well-being depends on environmental conservation.[7] As a result, businesses are prepared to actively contribute to bringing about constructive social and environmental change. As a result, digital platforms for green certification are growing in acceptance and popularity throughout the world, especially in Europe and Asia. Yet, each nation and region on these continents has a different level of acceptance and awareness.

Familiarity of the EU with the green certification platforms

The EU has adopted digital technology in many industries, especially the food and beverage sector. The EU Organic certification, GlobalG.A.P., and Fairtrade International are specific examples of the digital green certification platforms. These systems offer remote evaluations and audits and enable farmers and food processors to submit their products for certification online. These technologies improve the food supply chain's access and traceability, which also give customers more details about the products' environmental impact and organizations' sustainability.

The European Union has implemented several policies and initiatives to promote the use of green certification schemes and standards. Overall, in the European agri-food and beverage industry, several digital systems for green certification are in operation, including:

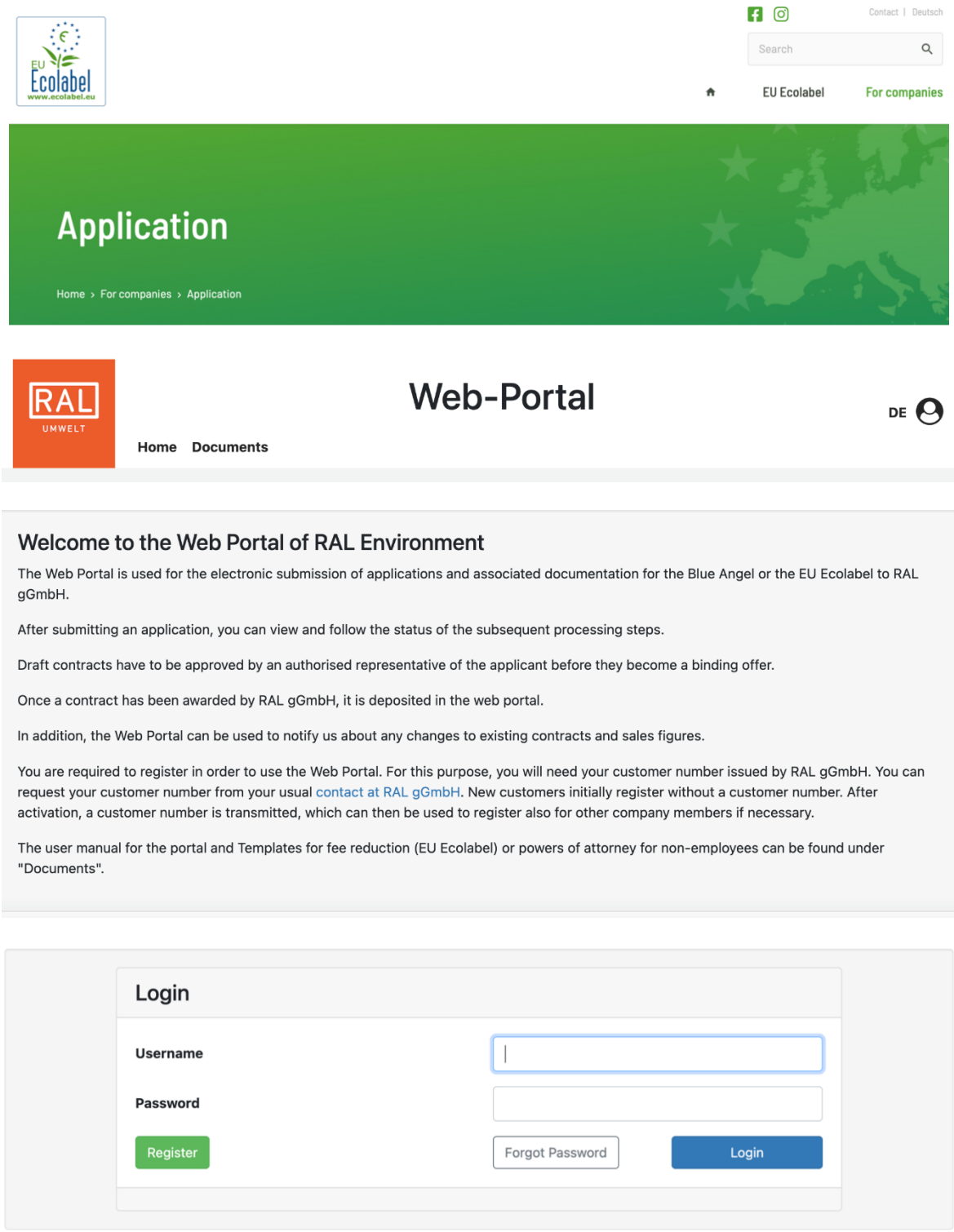
1. EU Organic Certification - The European Union has set rules for organic food production and farming, and goods that adhere to these requirements can be certified as organic. The application process is online, but the on-site inspection will be involved before the issuance of the certification.
2. The Rainforest Alliance – It is a program for certifying goods like coffee, cocoa, and tea. It evaluates the sustainability of farms, including their effect on the environment and society. The initial process and much of the communication with the verification body can be done online.

[7] https://www.foodcircle.com/magazine/certifications-for-food-manufacturers

3. Fairtrade - With an emphasis on equitable prices and working conditions, Fairtrade is a certification program that evaluates the sustainability of farms and producers and offers accreditation for goods like coffee, cocoa, tea, and bananas. The application can be completed online but the audits are conducted on-site.
4. GlobalGAP - Good agricultural practices, such as food safety, sustainability, and societal welfare, are the emphasis of the certification program. The self-assessment can be completed online and most of the communication with the verification body can done online.
5. MSC (Marine Stewardship Council) - A certification program that certifies seafood goods and evaluates the sustainability of wild-capture fisheries is the MSC. The application process can be done online but on-site assessment should be done as well.
6. ASC (Aquaculture Stewardship Council) - An accreditation program that certifies seafood products and evaluates the sustainability of aquaculture enterprises. The application process can be done online but on-site assessment should be done too.

The most prominent green certification is a voluntary EU Ecolabel, and it certifies goods and services that meet high environmental standards throughout their entire value chain, from raw materials to their production, processing, and distribution to market. EU Ecolabel confirms that the products are produced under the condition of low environmental impact. It also encourages companies to develop innovative products that are durable, easy to repair, and recyclable. The application for the EU Ecolabel is quite simple and easy to follow. The companies can submit the application as a manufacturer, importer, service provider, wholesaler, or retailer. First, the applicant should see the certification checklist and ascertain if the company or its product is capable for applying and obtaining certification. If yes, the entity can start the process through website named RAL (the system has actively been used in Germany). The company in charge of running the EcoLabel digital infrastructure and managing the EU Ecolabel in Germany is called RAL (Deutsches Institut für Gütesicherung und Kennzeichnung e.V.).

At the certification webtool the applicant should create their own profile by registering with Username and Password. Once the profile is created, basic info details about the company can be uploaded, and the whole certification process will be commenced.



The EU Ecolabel certification digital process:

1. Application and fee: MSMEs must submit a certification application online attaching the supporting paperwork and pay necessary fees on the platform.
2. Product evaluation: To ascertain whether a product satisfies the necessary requirements, the Verification Body evaluates the documents online and product using the EU Ecolabel criteria.
3. Testing: To make sure that their product complies with the necessary standards, MSMEs may need to have it tested by an accredited laboratory, depending on the type of product.
4. Inspection: To make sure the MSME's facilities satisfy the necessary environmental and social criteria, the Verification Body may perform an on-site inspection.
5. Permission: The Verification Body will provide permission for the use of the EU Ecolabel on the product if it satisfies the criteria for the label.
6. Labeling: MSMEs may use the EU Ecolabel on their products and in their marketing materials after approval has been given.

The EcoLabel digital platform is intended to be user-friendly and accessible to businesses of all kinds, though the platform's usability may vary depending on the experience and preferences of each user. The platform provides a variety of resources and tools, such as step-by-step instructions, FAQ sections, and contact details for the pertinent Verification Body, to assist companies with the certification process.

A 2020 Eurobarometer survey found that 47% of European consumers said they search for eco-labels when buying products, and 77% of consumers in Europe were aware of the EU Ecolabel. More than 87,000 products and services, and 2,200 companies across various categories have been certified with the EU Ecolabel, which has been gradually growing in popularity over the years[8].

Familiarity of Asia with the green certification platforms

In contrast, Asia has been a bit slower in adopting technology for green certification. While there are some green certification programs operating in Asia, prominently the ASEAN Organic Certification program and the China Organic Certification program, the adoption of certification digitization in general is still limited. One of the reasons for this is the lack of infrastructure and resources to support the implementation of digital platforms for certification in some parts of Asia. In addition, there may be cultural and operational barriers that could hinder the adoption of such platforms.

The adoption of digital technologies is being encouraged across Asia. For instance, to facilitate the certification of sustainable palm oil production, the Indonesian government has launched a digital portal. The Thai government has also been promoting digital technology in the agricultural industry, which may make it easier for digital green certification platforms to become popular soon.

[8] https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel-home_en

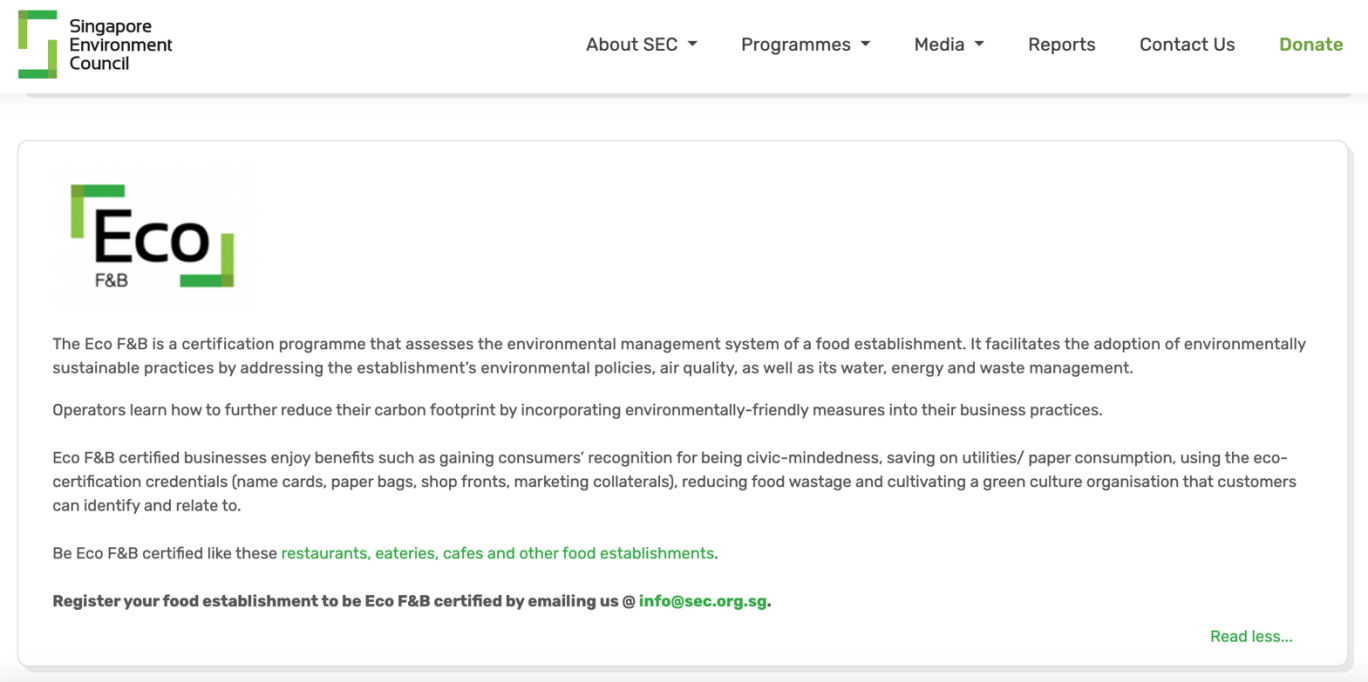
There are several examples of green certification digital platforms in Asia:

1. ASEAN Organic Certification (AOC) - AOC is an online tool that certifies products from organic agriculture in Southeast Asia. It provides a database of certified goods and a list of organic producers and processors.
2. China Organic Certification (COC) - COC is a Chinese digital platform that certifies items derived from organic agriculture. It offers a directory of certified organic farmers and processors as well as a database of certified organic goods.
3. Global GAP — A digital platform that certifies agricultural products in Asia, GAP is a stand-alone acronym for good agricultural practices. It provides a list of certified farmers and processors as well as a database of certified products.
4. Sustainable Rice Platform (SRP) - SRP is a digital certification tool for Asia's sustainable rice industry. It provides a registry of certified rice farmers and processors as well as a database of certified rice products.
5. Sustainable Palm Oil (SPO) - SPO is a digital certification program for Asia's sustainable palm oil industry. It provides a registry of certified palm oil growers and processors as well as a database of certified palm oil products.

Many Asian countries have established their own green certification platforms, such as Green Mark in Singapore (https://www1.bca.gov.sg/buildsg/sustainability/green-mark-certification-scheme), CASBEE in Japan (https://www.ibec.or.jp/CASBEE/english/certificationE.htm), and G-SEED in South Korea. These platforms are gaining recognition and are often endorsed by local regulations, building codes, or procurement policies.

Singapore Green Plan 2030 is a green certification scheme introduced by the Singapore government that aims to promote sustainable practices in different sectors, including food and beverage. The certification encourages businesses to reduce their carbon footprint and adopt sustainable production methods. The Eco F&B is an online certification platform that assesses the environmental management system of a food establishment operating in Singapore. It facilitates the adoption of environmentally sustainable practices by addressing the establishment's environmental policies, air quality, as well as its water, energy, and waste management.[9] Eco F&B certified businesses or products enjoy the benefits of gaining consumers' attraction, using the eco-certification credentials on their name cards, paper bags, shop fronts, and marketing materials.

[9] https://www.sec.org.sg/eco-certifications.html



Japan's green food system strategy aims to create a sustainable food system by improving environmental, social, and economic impact through enhancing engagement of stakeholders at each stage of food supply chains and promoting innovation to reduce environmental load. The Strategy's targets include net zero emissions from primary industries by 2050 and encourage imports of sustainably and ethically produced ingredients among other environmental, sustainability, and governance (ESG) goals. The strategy is started to be supported by the stakeholders; for example, the large supermarket chain Aeon has developed a Sustainable Procurement Policy/2020 Target. One goal is to have a third party certify that its private-label brands follow good agricultural practices. It is mandatory for an operator, including producer and processor, to obtain organic Japanese Agricultural Standards (JAS) certification from a registered certification body by having their operation inspected for their product to claim organic on crops or processed foods in Japan. Producers, including importers must be inspected by the registered certification bodies to evaluate their production to comply with JAS standards. Besides JAS, Japan Organic and Natural Foods Association (JONA)[10] is a certification program in Japan that certifies organic and natural food products. JONA is a private certification program for operators' entire value chain not covered by organic JAS standards, such as aquaculture products, alcohol beverage, and honey. JONA certification is partially online, and it ensures that the food and beverages are produced without the use of synthetic substances and fertilizers, pesticides, or genetically modified organisms and produced under environmentally friendly management.

JONA's online platform offers few advantages for businesses in Japan:

[10] https://www.jona-japan.org/english/

- Convenient and accessible. Businesses can apply for certification at any time, from any location, using the online application procedure, eliminating the need to go to a real office.

- Timesaving. When compared to conventional paper-based applications, the online application procedure is faster. This shortens the time it takes for products to hit the market by enabling businesses to get certified more rapidly.

- Cost-effective. Since there is no longer a need for tangible documentation, printing and mailing expenses are minimized.

- Improved traceability. The online certification program offers a method for managing and tracking applications and certificates that businesses can use. This contributes to the certifications and the goods its covers' authenticity.

- Greater transparency. The certification procedure is more transparent. In addition to giving customers information about the certification process and the products that have been certified, this enables businesses to keep track of the progress of their application and certification.

Section 2. IT developments of existing international green certification platforms

2.1. International green certification platforms and their IT developments

The development of IT for international green certification procedures has increased significantly in recent years as technology has become increasingly important in enabling the creation, execution, and monitoring of sustainability programs. International green certification platforms have used cutting-edge IT solutions more frequently to manage and enhance sustainability measures.

- 1990s: The United States Green Building Council created LEED (Leadership in Energy and Environmental Design), the first green certification scheme (USGBC). The IT advancement in green certification at this time, however, was restricted to simple computer systems for data gathering and analysis.
- 2000s: To mimic and improve building performance, green certification organizations started utilizing increasingly sophisticated software, such as Building Information Modeling (BIM) and energy modeling tools. This made it possible to identify sustainable design tactics and conduct more precise energy modeling.
- 2010s: green certification platforms increasingly used cloud-based systems, which made it simpler to access, analyze, and report on sustainability metrics. Moreover, the Internet of Things (IoT), which enables real-time monitoring and reporting of sustainability parameters, was introduced.
- 2020s: platforms for green certification will use artificial intelligence (AI) and machine learning to examine enormous datasets and find patterns and insights that would be overlooked by people. Moreover, blockchain technology is being used to improve accountability and transparency in green certification networks.

Here are some examples of how technology is used in the development of green certification digital platforms:

1. Cloud-Based Platforms: To manage and preserve data pertaining to sustainability activities, several green certification platforms increasingly use cloud-based systems. Accessing, analyzing, and reporting sustainability information are made simpler as a result. To measure progress toward sustainability objectives, cloud-based systems offer a common repository for sustainability data that can be accessible by all stakeholders, including building owners, renters, and sustainability consultants. Real-time monitoring and reporting of water and energy use, trash generation, and other environmental parameters are also made possible by cloud-based solutions.
2. Building Information Modeling (BIM): A building's systems are represented digitally in BIM. To design, build, and maintain buildings more sustainably, green building

certification platforms use BIM software. BIM enables users to simulate and optimize the building's performance to find possibilities to boost waste reduction, occupant comfort, and energy efficiency. To determine the most sustainable choice, BIM models can be used to assess various situations, such as the effects of various materials, systems, or designs.

3. Internet of Things (IoT): IoT gadgets, such as sensors and smart meters, are more frequently utilized to gather information on waste output, water and energy use, and other environmental indicators. Green certification platforms can incorporate IoT devices to allow real-time monitoring and reporting of sustainability metrics. In order to improve heating, cooling, and lighting systems and save energy usage, sensors can be installed to monitor occupancy and human movement inside a building. Smart meters can be used to track how much energy, water, and gas are consumed as well as to give consumers immediate feedback to help them cut back.
4. Blockchain: Blockchain technology can be utilized to improve accountability and transparency in platforms for green certification. The unchangeable record of sustainability data provided by blockchain can be used to validate sustainability claims and guarantee that the data is accurate and dependable. Blockchain can be used, for instance, to trace the origin of sustainable resources to make sure they satisfy certification requirements, such as recycled steel or certified wood.
5. Artificial Intelligence (AI): AI and machine learning technologies can be used to examine big data sets and find patterns and insights that humans would overlook. AI can be used to improve sustainability practices and find areas for growth. AI can be used, for instance, to evaluate data on energy use to find places where energy can be saved, like by improving HVAC systems or changing lighting levels. To forecast future energy and resource use and to inform sustainability initiatives, AI can also be used to find trends and patterns in sustainability data.

Overall, the development of worldwide green certification through IT has made it possible to handle sustainability activities more precisely, effectively, and efficiently. Green certification systems will increasingly use these capabilities as technology develops to increase their effect and encourage more sustainable practices.

The adoption of green certification platforms and the ongoing technological development of these platforms are vital to satisfying the sustainability demands of today's consumers as the food and beverage sector continues to face increased pressure to solve sustainability concerns. Green certification schemes are positioned to play a key role in boosting the operation of food and beverage producers more sustainably and responsibly as the demand for sustainable products continues to rise.

These IT tools can be ideal for building green certification digital platform for SOGE. However, the utilization of any IT technologies highly depends on the certification scheme, scope, criteria, requirements, and certification process.

- **Data management and analytics tools:** A green certification digital platform should be furnished with powerful data management and analytics tools to accurately evaluate the environmental impact of products. These tools are useful for monitoring and analyzing a variety of environmental indicators, including carbon emissions, water use, and waste production, and they can give instant input to businesses looking to be certified.
- **IoT sensors and tracking tools:** IoT sensors can be used to track electricity use, water quality, and other environmental indicators in real-time. Making data-driven decisions about their operations and identifying areas where they can better their environmental performance can both benefit businesses.
- **Blockchain technology:** A safe and open database of environmental performance data can be produced using blockchain technology. This can foster confidence between customers and businesses by assisting in the authenticity check of green certifications.
- **Artificial intelligence and machine learning:** These two technologies can be used to evaluate environmental data and spot trends that can be exploited to improve environmental performance. These technologies, for instance, can be used to pinpoint areas where waste generation or energy consumption can be decreased.
- **Mobile and web applications** can be used to make the certification procedure more accessible to businesses looking to become certified. These tools can be used to send data, contact certifying bodies, and monitor certification progress.

2.2. Features, functions, and user-friendliness

Green certification digital platforms typically include tools for calculating environmental metrics such as carbon emissions, energy usage, water consumption, and waste generation. They also offer reporting systems that allow businesses to share their sustainability data with stakeholders and often provide guidance and resources for developing sustainability goals and strategies. Many green certification platforms also offer recognizable symbols of sustainability, such as logos or certification marks, which businesses can use on their products and marketing materials to communicate their commitment to sustainability to consumers. The user-friendliness of these platforms is critical, as they need to be intuitive and accessible to businesses of all sizes and levels of technical expertise. To meet this requirement, many green certification platforms are designed with user-friendly interfaces and easy-to-understand reporting systems that allow businesses to track their sustainability performance quickly and easily over time.

Depending on the requirements and objectives of the certification digital platforms, the key characteristics may differ. However, some crucial elements that can be useful for SOGE digital platform for green certification include:

VIII. The digital platform should have a user-friendly layout. It means users should be able to easily explore the platform and find clear instructions there.
IX. Management and analysis of data pertaining to environmental performance (as required in the scheme criteria) should be possible to see at the platform. This information can be used to pinpoint areas that need to be improved to satisfy certification requirements.
X. Automated data collection and real-time monitoring of performance can speed up the certification procedure and supply accurate, current information.
XI. The platform should present information about the certification procedure that is open and traceable, including the standards used for evaluation, the status of each product's certification, and any certifications that have been revoked or suspended.
XII. The platform should be usable on mobile devices, which is useful for certification-seeking businesses that might not have access to a desktop computer.
XIII. Tools that promote collaboration and communication between organizations pursuing certification and certification bodies should be available on the platform. This can include file-sharing options, messaging services, and chat functions.
XIV. To guarantee consistent and accurate information about certified products and organizations, the platform should be able to connect with other digital platforms, such as e-commerce websites or supply chain management systems.

Overall, green certification digital platforms offer user-friendly features and functions, such as online audit tools, collecting, monitoring, and reporting data, providing guidance and resource tools, and allowing producers to utilize recognizable symbols or marks, which can help businesses

to communicate their commitment to consumers on the market. The following are some of the characteristics, capabilities, and user-friendliness of certain well-known green certification platforms worldwide:

Certification	Purpose	User Friendliness	Functions
Leaf Marque[11]	UK-based certification for environmentally friendly farming	Online auditing tool with thorough instructions to monitor the progress and completion of audits.	o Training and advice on soil management, water use, and energy efficiency o Biodiversity survey o Submit documents o Upload images o Fee payment o Self-assessment o Inspection scheduling o Certification status
Fairtrade[12]	Ascertains that farmers in poor nations are appropriately compensated for the output and labor generated in a sustainable and safe manner	A cloud-based platform where clients can gather, manage, and report sustainability data on issues including ethical business practices, social responsibility, and environmental impact	o Training on certification o Submit documents o A visible emblem o Fee payment o Inspection scheduling o Certification status check o Training, networking o Complaints and disputes
RSPO[13]	The Roundtable on Sustainable Palm Oil (RSPO) certification program has been developed to encourage sustainable palm oil production.	Users can receive information on the RSPO certification procedure, monitor their certification progress, and manage their certification needs using the platform's user-friendly interface.	o Contact specialized expert o online learning resources o access to recommendations and best practices o dashboard to monitor progress o upload & manage supporting materials o alerts and reminders about certification criteria

[11] https://leaf.eco

[12] https://www.fairtrade.net/

[13] https://rspo.org/

			o make complain or suggestion
Green Coffee Association[14]	A scheme demonstrates that coffee importers and merchants follow environmentally friendly procedures.	This platform offers a simple method for tracking and disclosing sustainability data, such as the environmental effects, social responsibility, and economic viability.	o apply and upload the necessary files and data online o manage documents including certificates, inspection reports, and other pertinent documents. o Plan GCA inspections schedule and manage online o safe online payment processing method o look up certification status by looking up its GCA certification number on the GCA website
Marine Stewardship Council[15]	certification program ensures that seafood is sourced responsibly.	It offers a cloud-based system that allows companies to easily check and report sustainability data, including fishery health, biodiversity, and community impact across their supply chain.	o conduct fishery assessments o submit reports and documentation, setting up audits, and monitoring certification status o Seafood traceability allowing users to follow the path of seafood products o interact with the MSC learning programs o informs consumers about the MSC

[14] https://greencoffeeassociation.org/

[15] https://www.msc.org/

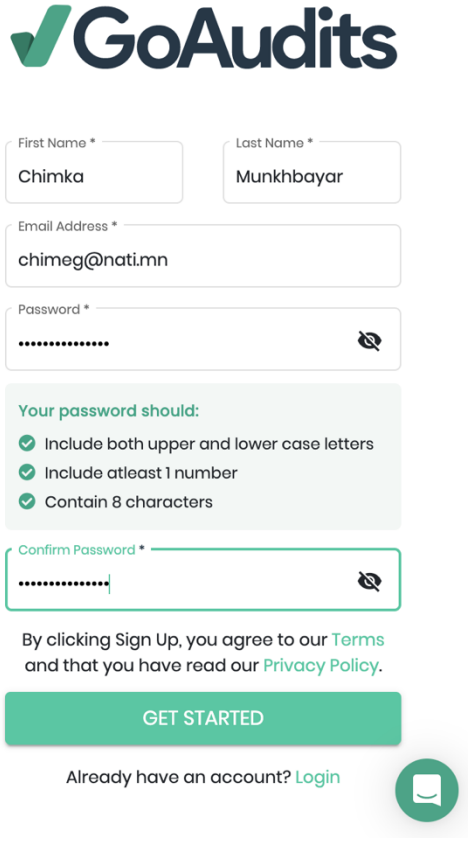
Since consumers and food supply chain stakeholders demand more responsibility and transparency from producers and retailers about their sustainability, green certification organizations, and their schemes have become an important body in the food and beverage industry. Green certification digital platforms include various features and capabilities that assist small and medium sized businesses in navigating the certification procedure, putting sustainable practices in place, and informing stakeholders and customers about their sustainability initiatives.

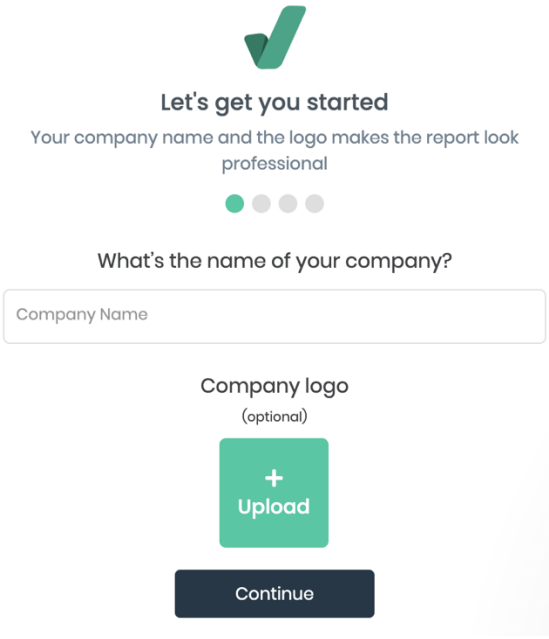
Certification digital platforms also offer a range of functions, such as assessments and audits, recognition for organizations that meet the certification criteria, and networking opportunities for certified organizations and sustainability professionals. These features and functions help platform users to identify areas for improvement, build credibility, and stay up to date on the latest sustainability trends and green practices.

Platforms for green certification are created to be user-friendly and available to businesses of all sizes and in various locales. They make sustainability more accessible to a larger range of organizations by providing flexible certification alternatives and affordable solutions. Through navigating logos and labels, they also assist buyers in becoming aware of sustainable practices and green management of production. Consumers and stakeholders find it more credible, and it supports businesses in their efforts to be sustainable.

2.3. Platform workflow

The workflow in green certification scheme in the food and beverage sector has several steps to assess or audit on applicant entity's sustainable practices. The process typically begins with online registration, where the applicant inputs basic information about its name, location, products, and contact details. One of the good examples we can look at can be "GoAudits" the auditing service based in the US, Europe, and Australia. It is an auditing tool to make it easier and more effective for companies and organizations to conduct audits and inspections for certifications. The app offers a variety of features and functions to help auditing operations and is compatible with both iOS and Android devices. When the user downloads the app, and the initial stage will be creating your dashboard by signing app. The app basically asks the user who and why the user needs auditing. After signing in to the app or website the question will be more directed about the company and options for the certification will provided and the entity can choose the certification and start the auditing process in general.


GoAudits
First Name *
Chimka
Last Name *
Munkhbayar
Email Address *
chimeg@nati.mn
Password *
Your password should:
Include both upper and lower case letters
Include atleast 1 number
Contain 8 characters
Confirm Password *
By clicking Sign Up, you agree to our Terms and that you have read our Privacy Policy.
GET STARTED
Already have an account? Login


Let's get you started
Your company name and the logo makes the report look professional
What's the name of your company?
Company Name
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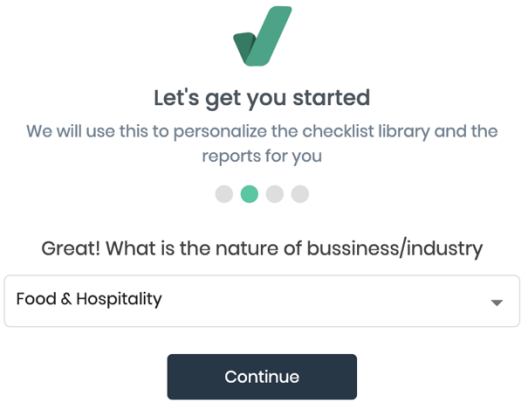
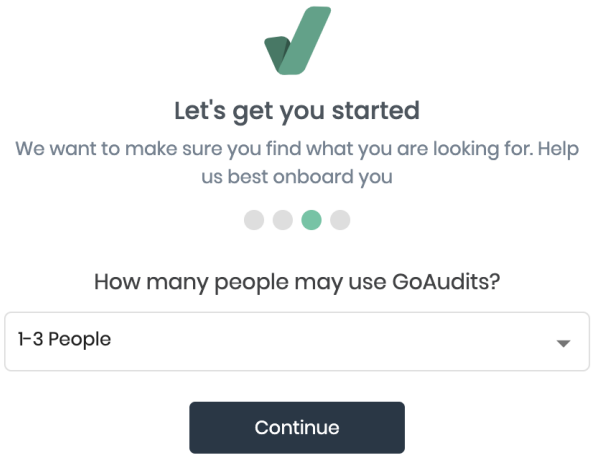
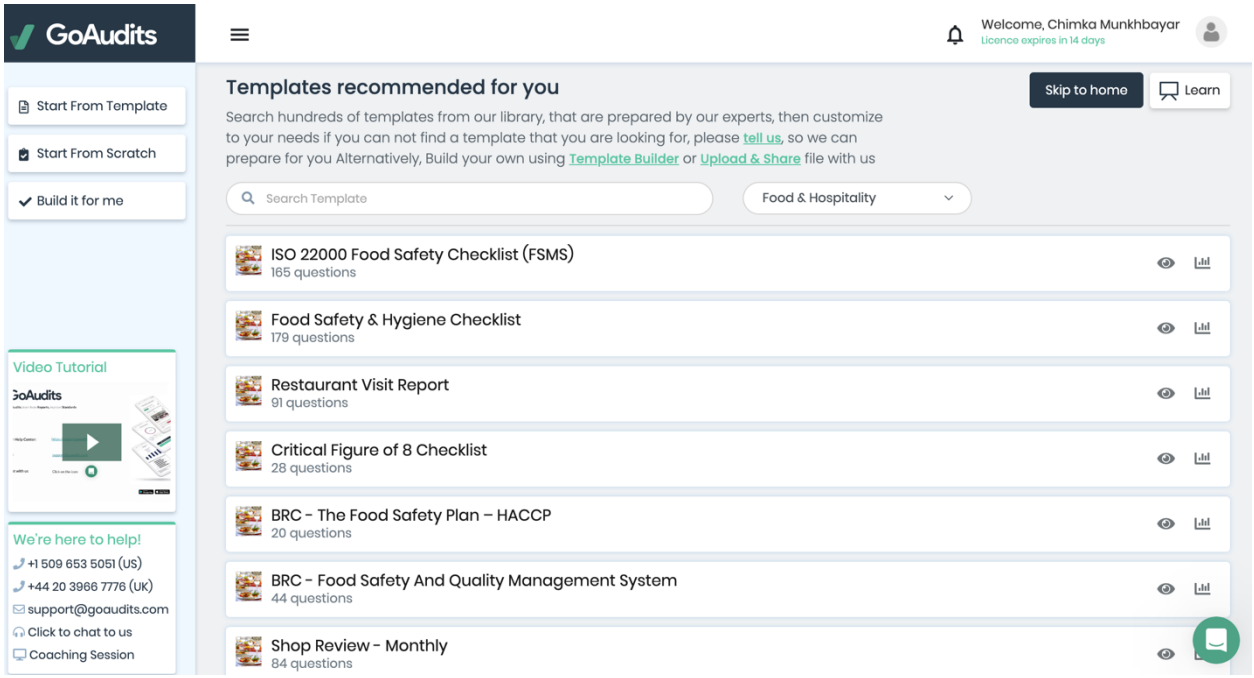
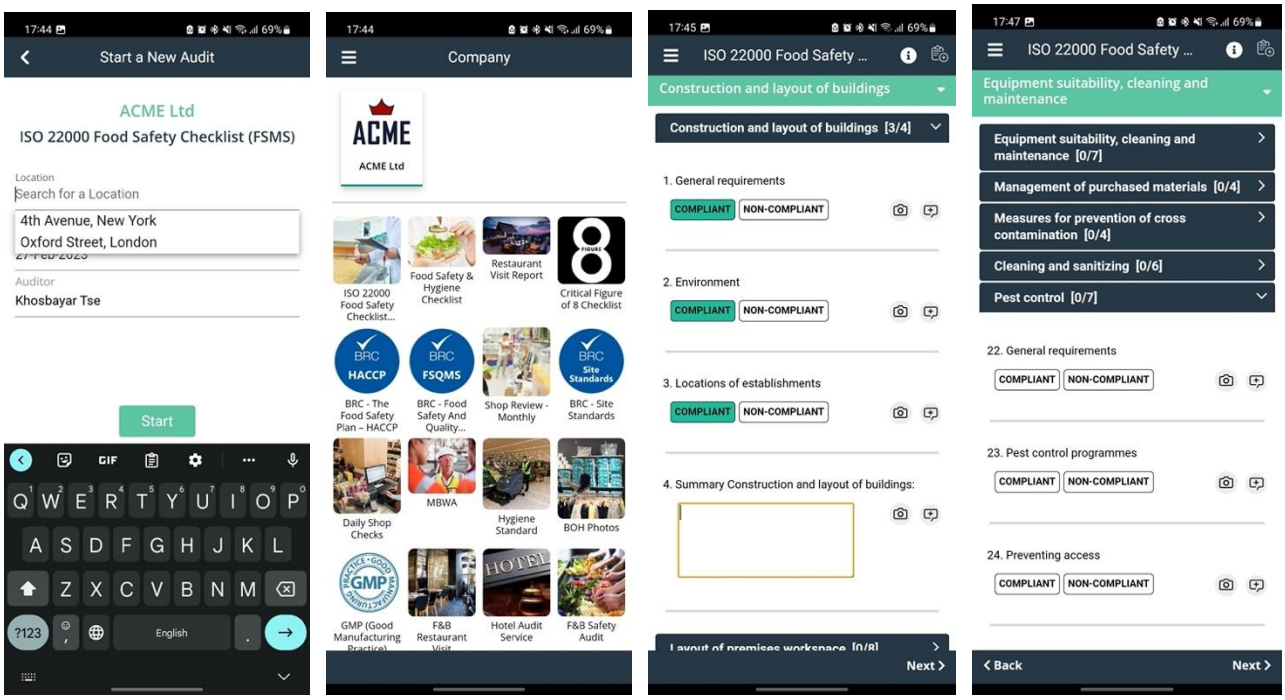

Let's get you started
We will use this to personalize the checklist library and the reports for you
Great! What is the nature of bussiness/industry
Food & Hospitality
Continue


Let's get you started
We want to make sure you find what you are looking for. Help us best onboard you
How many people may use GoAudits?
1-3 People
Continue

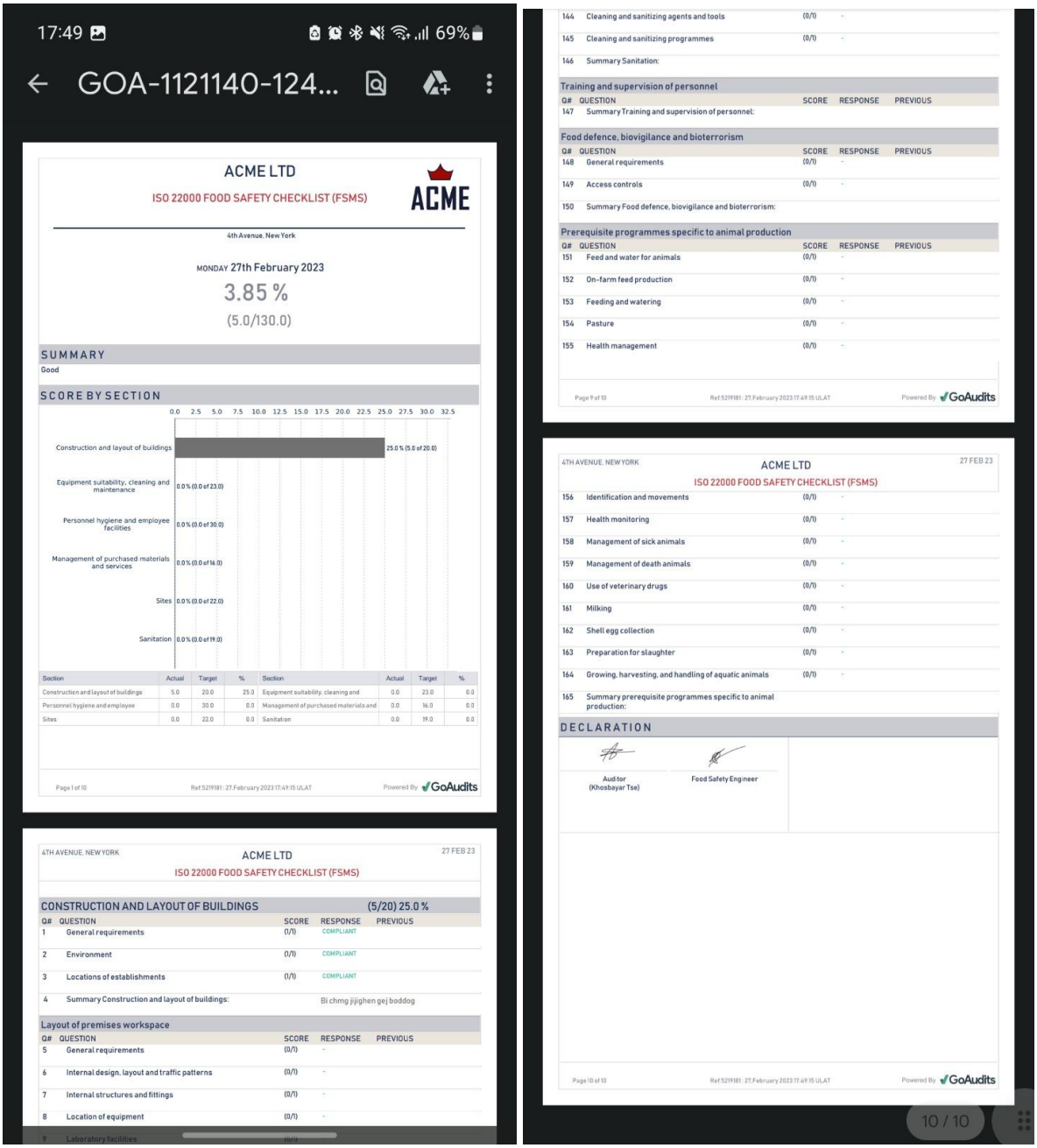
After setting up own dashboard the user must select what type of certification his or her organization is seeking to apply and then obtain certification. Once selecting the certification, the checklist necessary to satisfy will be listed and shown with the action steps to take.



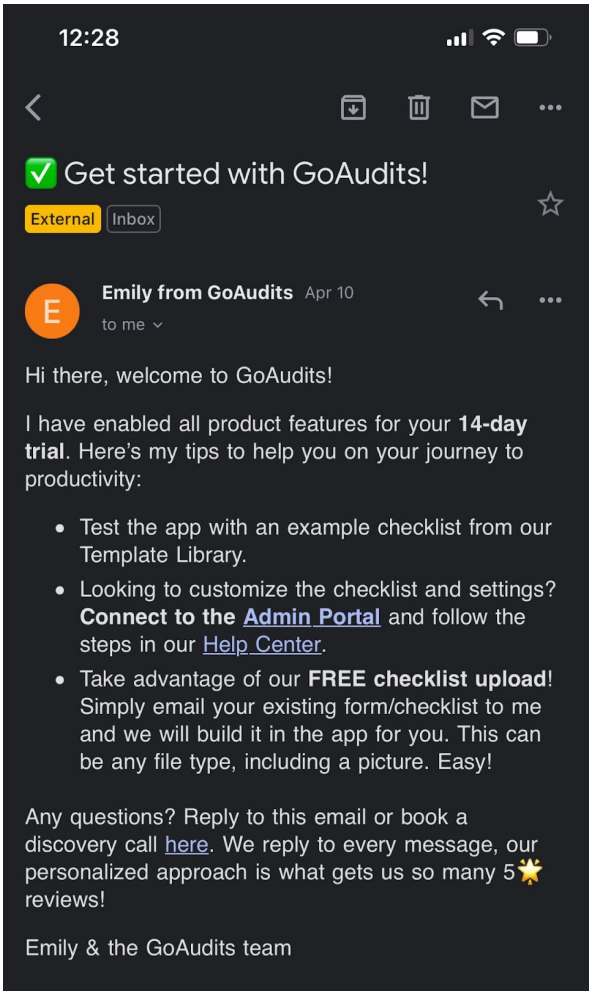
We have selected ISO 22000 Food Safety Checklist (FSMS) as shown on the picture above and proceeded with the app and it goes as follows:

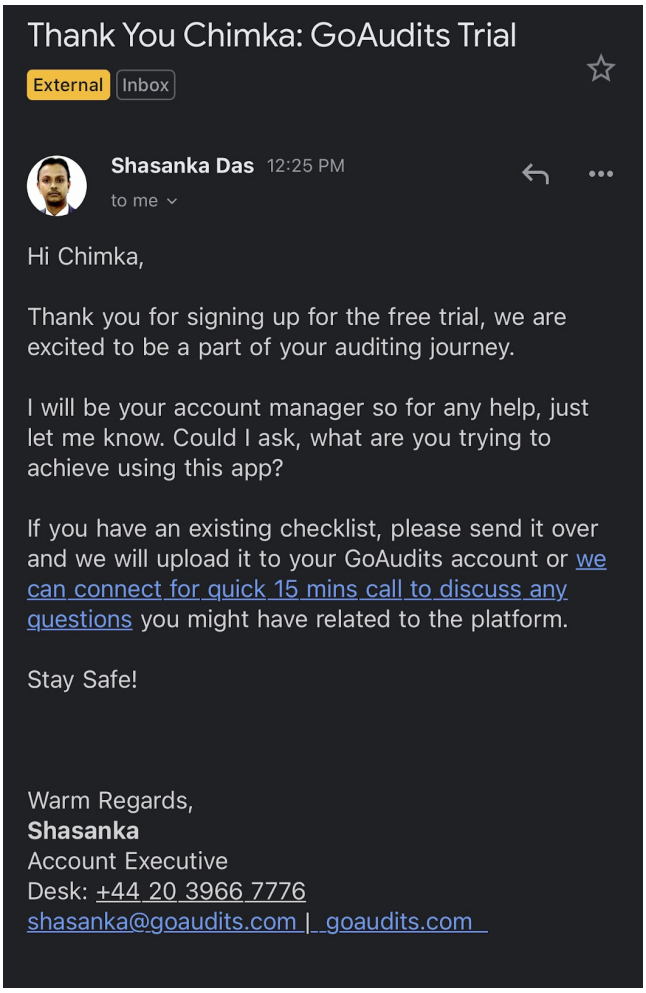


After selecting the certification type the entity (user) is necessary to take the self-assessment test by answering specific questions included in the checklist so the app will automatically calculate the score to provide very initial idea of whether the entity is prepared for obtaining the certification. If the score is not high enough the recommendation of improvement will be given so that the entity can apply next time. If the score is high enough to continue the certification process the auditors will be assigned for on-site meetings and check-ups. The assumption is that GoAudits can allow both certification applicant and the auditors have the profile on the app so that once the potential applicant applies the auditor gets notified and assigned for the on-site meetings.



After the user registered and took the self-assessment test on the GoAudits app and website, the company's real employees follow-up with the applicant through email and proceed through the next steps as shown on the screens below:





In general, GoAudits application has the following features and functions including:

- Forms that can be customized: GoAudits users can design and edit their own audit forms to suit their unique requirements. This includes adding various sorts of questions, fields, and sections.
- Real-time reporting: The software offers real-time reporting, enabling users to see audit findings and analysis right away.
- Online and offline compatibility of GoAudits enables customers to conduct audits even when there is no internet connection nearby.
- Task management: Using the app's task management features, users can allocate and oversee tasks to team members depending on audit findings.
- GoAudits offers analytics and insights into audit results and trends, enabling companies to pinpoint areas for improvement and streamline their processes.
- Collaboration between many teams and departments is made possible by the app's ability to be integrated with other company tools and systems.

The requirements for green certification in general often involve several elements, including:

1. Technical Requirements: The precise environmental performance standards that a structure, good, or service must satisfy to be certified.
2. Auditing: The process of assessing a structure, good, or service against the technical specifications of the standard to see if it complies with the requirements.
3. Certification: The official declaration that a structure, good, or service complies with environmental performance standards.
4. Monitoring: The continual assessment of certified structures, goods, or services to make sure they remain in compliance with the standard's environmental performance specifications.

Before proceeding with the certification process, many certifications digital platform (web or mobile app) offer a pre-assessment or gap analysis to aid companies identify areas where improvement is needed. This involves a review of the organization's current sustainability practices and a report outlining recommendations. This step is essential to ensure that the applicant organization is ready for the formal assessment process.

The organization enters the assessment phase with some preparation. An agreement on certification audit is finalized with the producers at this step, and a third-party certification authority sends an auditor to visit the applicant's facilities and perform an audit to assess the sustainability procedures. To determine whether sustainability criteria are being met, the auditor frequently examines documents, speaks with staff, and visits the site. This procedure aims to confirm that the business applies sustainable practices to all aspects of its operations and supply chain.

After the assessment, the auditor provides a report detailing the findings of the audit and any areas where the organization needs to improve its sustainability practices. The organization is then required to develop a corrective action plan to address any issues identified in the report. The corrective action plan is an essential step to ensure that the organization is committed to continuous improvement and maintaining sustainable practices.

If the organization successfully completes the assessment and agrees to implement the corrective action plan, it can be certified as sustainable by the certification provider. The organization is then allowed to use the certification mark on its products label and marketing materials to communicate its commitment to consumers.

Once certified, organizations must undergo periodic follow-up audits to ensure that they continue to follow the certification scheme criteria. This surveillance audits typically take place annually or biannually. This step is important to make sure that the organization is maintaining its commitment

to sustainability and implementing continuous improvement practices based on the corrective action plan.

The workflow for green certification in the food and beverage sector in Europe and Asia follows a similar structure, but the specific certification procedure and sustainability standards may vary by countries.

In Europe, the Ecolabel certification platform sets strict sustainability standards for the food and beverage sector. The certification process typically involves a registration phase, where the organization provides basic information about its products and operations. Next, a pre-assessment or gap analysis is conducted by the internal auditors of the organization to identify organization's readiness to go through audits by third-party verification. This is followed by an on-site audit, where a third-party auditor reviews documentation, conducts interviews with staff, and visits the organization's facilities to assess compliance with the Ecolabel standards.

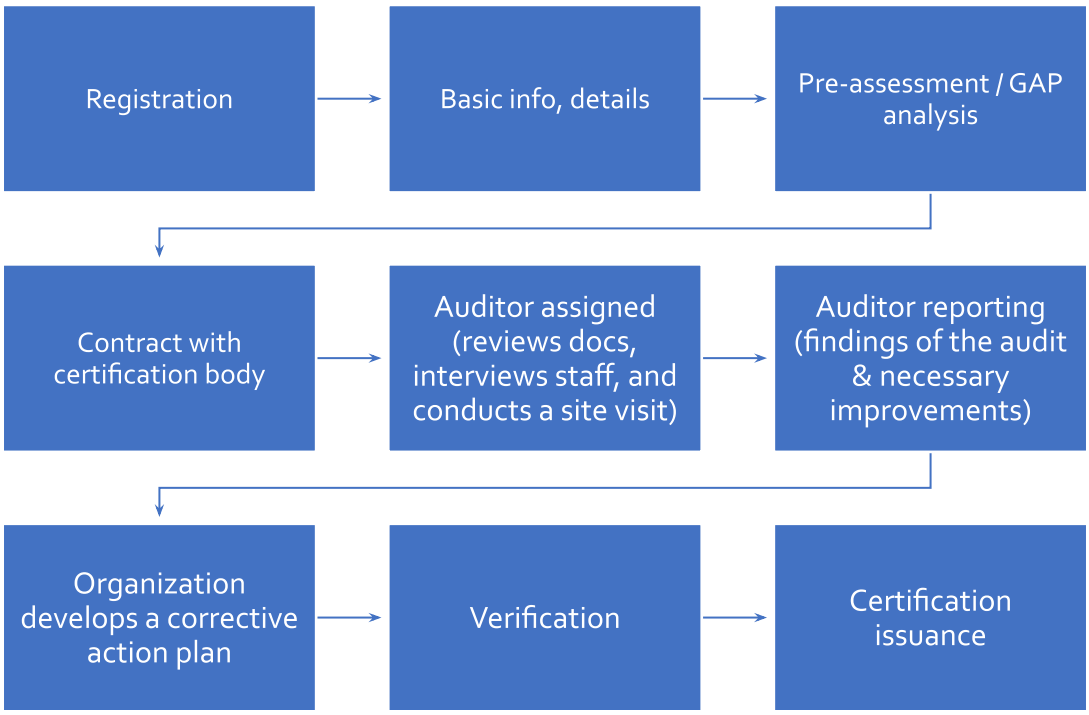
After the audit, the auditor provides a report with recommendations for improvement, and the organization develops a corrective action plan. It is possible for an organization to be certified and granted permission to use the Ecolabel certification mark on its goods and marketing materials if there are no findings of inconsistency against the sustainability practices/standards and the organization agrees to implement the corrective action plan. To ensure that it continues to meet the Ecolabel standards, the organization must submit to recurring follow-up audits.

In Asia, the Green Food Mark certification platform is widely recognized in China and sets sustainability standards for the food and beverage sector. The certification process typically involves a registration phase, where the organization provides basic information about its products and operations. Next, a pre-assessment or gap analysis is conducted to identify areas where the organization needs to improve its sustainability practices. This is followed by an on-site audit, where a third-party auditor reviews documentation, conducts interviews with staff, and visits the organization's facilities to assess compliance with the Green Food Mark standards.

After the audit, the auditor provides a report with recommendations for improvement, and the organization develops a corrective action plan. If the organization successfully implements the corrective action plan, it can be certified and allowed to use the Green Food Mark certification mark on its products and marketing materials. The organization must undergo periodic surveillance audits to ensure that it continues to meet the Green Food Mark standards.

In both Europe and Asia, green certification platforms in the food and beverage sector help organizations to achieve and maintain sustainable practices, build trust with consumers and stakeholders, and enhance their reputation for sustainability. The structured workflow provides a

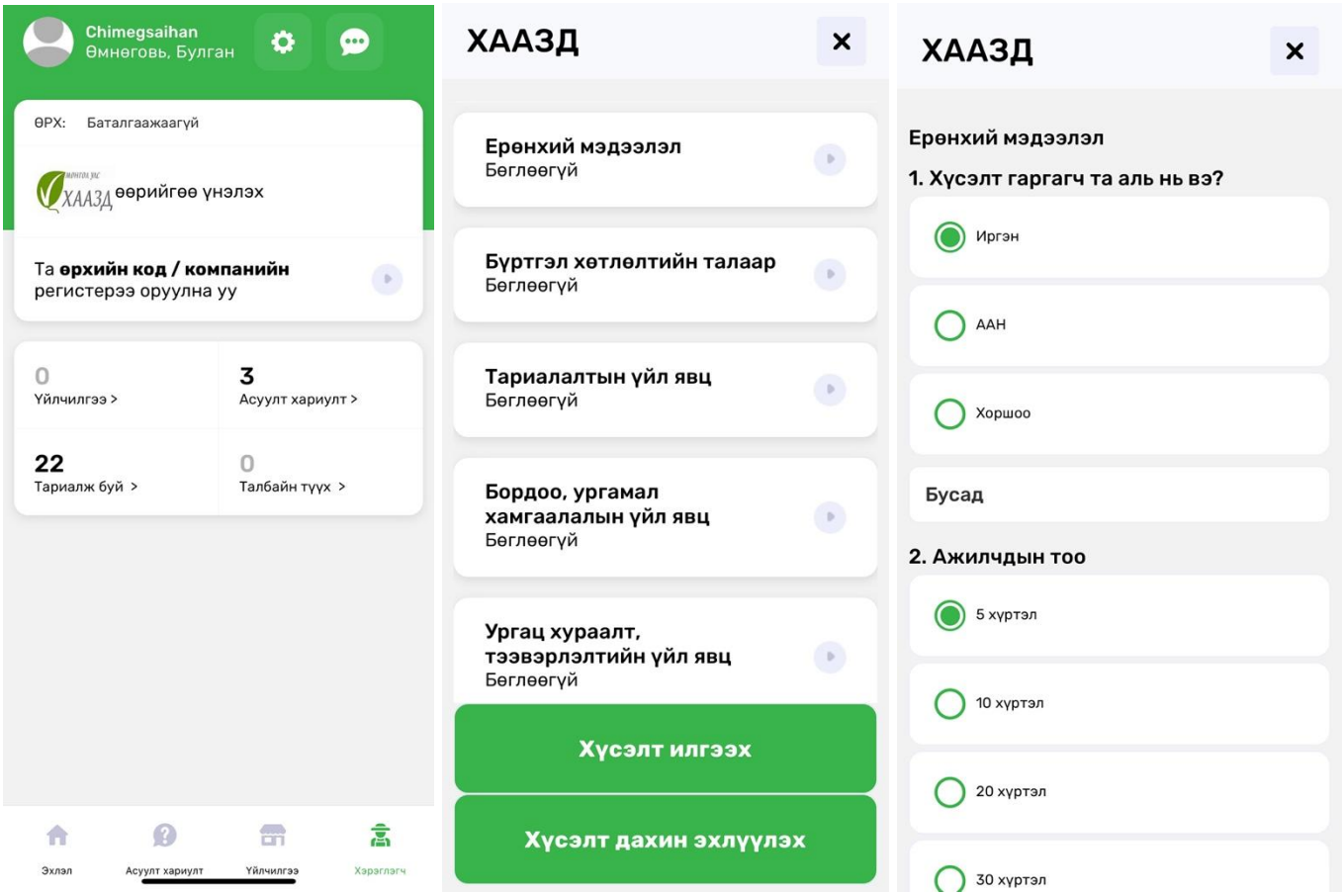
clear path to certification and continuous improvement, promoting sustainability across the food and beverage sector.

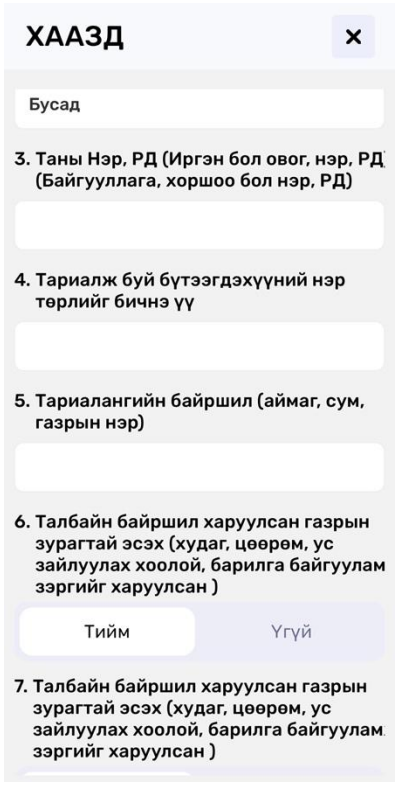


Pre-assessment for ecolabelling digital platforms often includes a preliminary assessment of a good or service to establish whether it qualifies for certification. The following actions may be part of the pre-assessment step: 1. Product assessment, 2. Review of paperwork, 3. Site visit, 4. Gap analysis, 5. Eligibility determination. If the participant fails on the pre-assessment test, the certification body can leave specific recommendations on how they can correct issues and re-apply. Or else even other training or consultancy services can be recommended to the applicant. All these stages can be digitized but the platforms mentioned in this report are all doing all these pre-assessment and overall verification process hybrid. It means some of the stages are fully digitized and some of them still depends on the manual human interactive process.

As presented on the above chart, the first stage of starting certification process would be downloading apps or surfing to the website so that the registration and basic info input can be done. After that the pre-assessment test can be taken by the applicant. For example, in Mongolia, in 2022 Agrolly in Mongolia app tested the GAP certification self-assessment test with 60 rural smallholder farmers in South Gobi province. The GAP pre-assessment analysis is basically a well-prepared test with 80 questions to find out more about the farmers' practice on the field including basic information about the farm, book records, soil, waste, and water management, pests and pesticide use, logistics, and employees' health and hygiene. Depending on the person to complete the assessment, it can be done in 30 minutes and after completion, based on the yes/no

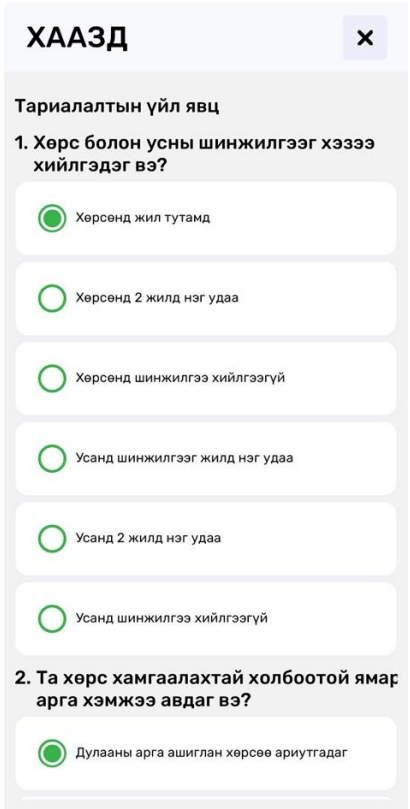
questions the Agrolly app provides the certain score however, the other questions should be reviewed by the auditor before proceeding to the contract making stage. For this case, the only pre-assessment test phase has been digitized and all other stages are still in manual certification issuance process. All the participant farmers could fill in the questions successfully and GAP certifying body followed-up with these farmers and half of them proceeded with the certification company for further stages. How much the process can be digitized depends on the easiness of the process to be digitized and possibility of the IT development for each stage.

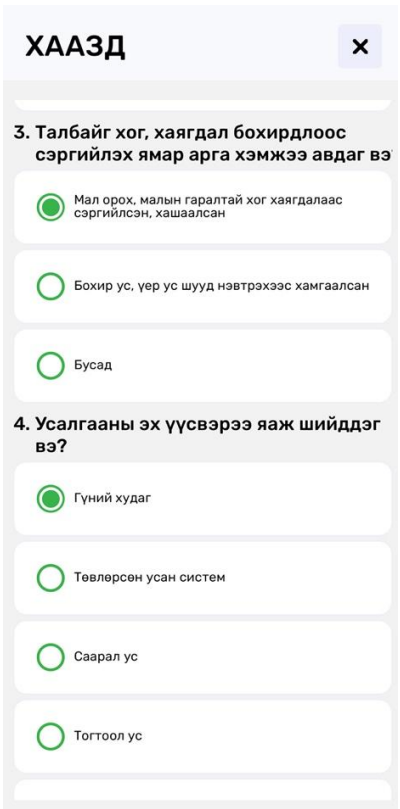


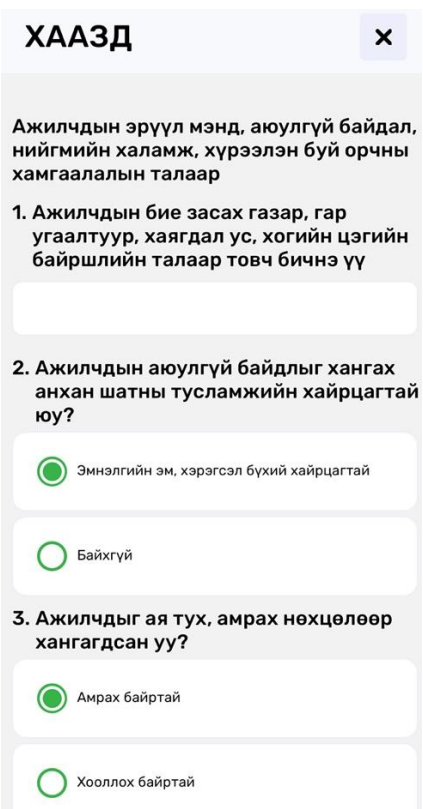

ХААЗД
Бусад
3. Таны Нэр, РД (Иргэн бол овог, нэр, РД (Байгууллага, хоршоо бол нэр, РД)
4. Тариалж буй бүтээгдэхүүний нэр төрлийг бичнэ үү
5. Тариалангийн байршил (аймаг, сум, газрын нэр)
6. Талбайн байршил харуулсан газрын зурагтай эсэх (худаг, цөөрөм, ус зайлуулах хоолой, барилга байгуулам зэргийг харуулсан)
Тийм
Үгүй
7. Талбайн байршил харуулсан газрын зурагтай эсэх (худаг, цөөрөм, ус зайлуулах хоолой, барилга байгуулам зэргийг харуулсан)


ХААЗД
Тийм
Үгүй
7. Талбайн байршил харуулсан газрын зурагтай эсэх (худаг, цөөрөм, ус зайлуулах хоолой, барилга байгуулам зэргийг харуулсан)
Тийм
Үгүй
8. Агуулахын төрөл Бүтээгдэхүүний
Тийм
Үгүй
9. Агуулахын төрөл Бордоо, пестицид хадгалах
Тийм
Үгүй
10. Агуулахын төрөл Бусад зүйл хадгала
Тийм
Үгүй
Хадгалах


ХААЗД
Бүртгэл хөтлөлтийн талаар
1. Талбайн түүх, тариалалтын үйл явцын бүртгэл
Тийм
Үгүй
2. Худалдан авалтын бүртгэл (үр, бордоо пестицид, бусад)
Тийм
Үгүй
3. Тээвэрлэлтийн бүртгэл хөтөлдөг үү
Тийм
Үгүй
4. Үйл ажиллагаагаа үнэлж, төлөвлөгөө, тайлан гаргаж дараагийн жилийн төлөвлөгөө гаргадаг уу
Тийм
Үгүй
5. Тарималын хаягдал болон пестициди хаягдалыг устгах бүртгэл хөтлөлттэй эсэх
Тийм
Үгүй


ХААЗД
Тариалалтын үйл явц
1. Хөрс болон усны шинжилгээг хэзээ хийлгэдэг вэ?
Хөрсөнд жил тутамд
Хөрсөнд 2 жилд нэг удаа
Хөрсөнд шинжилгээ хийлгээгүй
Усанд шинжилгээг жилд нэг удаа
Усанд 2 жилд нэг удаа
Усанд шинжилгээ хийлгээгүй
2. Та хөрс хамгаалахтай холбоотой ямар арга хэмжээ авдаг вэ?
Дулааны арга ашиглан хөрсөө ариутгадаг


ХААЗД
3. Талбайг хог, хаягдал бохирдлоос сэргийлэх ямар арга хэмжээ авдаг вэ
Мал орох, малын гаралтай хог хаягдалаас сэргийлсэн, хашаалсан
Бохир ус, үер ус шууд нэвтрэхээс хамгаалсан
Бусад
4. Усалгааны эх үүсвэрээ яаж шийддэг вэ?
Гүний худаг
Төвлөрсөн усан систем
Саарал ус
Тогтоол ус


ХААЗД
Ажилчдын эрүүл мэнд, аюулгүй байдал, нийгмийн халамж, хүрээлэн буй орчны хамгаалалын талаар
1. Ажилчдын бие засах газар, гар угаалтуур, хаягдал ус, хогийн цэгийн байршлийн талаар товч бичнэ үү
2. Ажилчдын аюулгүй байдлыг хангах анхан шатны тусламжийн хайрцагтай юу?
Эмнэлгийн эм, хэрэгсэл бүхий хайрцагтай
Байхгүй
3. Ажилчдыг ая тух, амрах нөхцөлөөр хангагдсан уу?
Амрах байртай
Хооллох байртай

Usually, small and medium-sized businesses (SMEs) often need to gather the following types of materials and data ready to submit when applying for certification:

- Product specifics, materials used, and production procedures must all be included in the precise information that SMEs must provide about their goods or services. Brochures or reports can work.
- Environmental impact assessments: SMEs may be obliged to present these reports, which list any potential effects their goods or services may have on the environment during the course of their useful lives.
- Sustainability reports: SMEs may be obliged to submit sustainability reports outlining their environmental, social, and economic implications of their sustainability efforts.
- Application for certification: Small and medium-sized businesses (SMEs) are required to apply for certification that details their operations, goods, and adherence to environmental laws and standards.
- Supporting documents: SMEs can be asked to submit supporting records, such as test reports from laboratories, supplier certifications, and other pertinent certificates.

To make sure they deliver the necessary papers and information on time and accurately, SMEs must collaborate closely with the ecolabeling platform, and any third-party organizations engaged in the certification process. To assist SMEs in gathering the required data and materials, the ecolabelling platform or outside organizations may offer advice and support.

Section 3. Business model of existing international green certification platforms

International green certification platforms in agriculture, food, and beverage sectors typically operate on a business model that involves **charging fees to businesses that seek certification**. These fees can vary depending on the size and complexity of the business operations, the type of certification sought, and the level of support and training provided by the certification platform.

One of the most common types of certification platforms is third-party certification, where independent organizations assess businesses against agreed-upon standards and issue certificates of compliance. These platforms typically charge fees for the certification process, which cover the costs of assessments, audits, and administrative works.

Another type of certification platform is self-assessment, where businesses assess their own compliance against established standards and issue their own certificates of compliance. In this model, the certification platform typically charges fees for access to the standards and guidelines and for training and support for self-assessment.

Some certification platforms also offer additional services such as **training, technical support, and marketing and branding to businesses seeking certification**. These services may be bundled with certification fees or offered as separate services at an additional cost. In addition to fees, certification platforms may also generate revenue from grants, donations, or partnerships with other organizations. For example, some platforms may receive funding from governments or international organizations to promote sustainable practices in developing countries.

Overall, the business model of international green certification platforms is designed to cover the costs of providing certification services while also generating revenue to support ongoing operations and expansion. While certification fees may be a barrier for some businesses, the benefits of certification in terms of improved sustainability performance and market access can often outweigh the costs.

3.1. Business model approach

The agriculture, food, and beverage industries' existing worldwide green certification systems' business models are geared toward advancing sustainability, strengthening supply chain transparency, and raising the value of products on the market. To introduce or implement green certification standards and guidelines that support sustainability of the production and environment, safety and quality of products, fair labor practices, and environmental protection, these platforms typically collaborate closely with all stakeholders in the sector.

Many stakeholders, including as farmers, producers, processors, retailers, and NGOs, frequently work together to set standards and recommendations. This makes it easier to make sure the

standards are applicable, useful, and broadly embraced by the sector. After the standards are created, platforms for certification offer certification services to companies looking to adhere to the requirements. These services often consist of certifications of compliance, on-site evaluations and audits, training, and technical support. To pay for these services as well as ongoing program extension and maintenance, certification fees are levied.

Various platforms for certification collaborate with consumers and merchants to encourage the marketability of certified goods. For instance, the MSC certification collaborates with merchants to develop in-store displays and marketing materials for consumers that emphasize seafood goods that are MSC-certified. Campaigns for branding and marketing as well as partnerships with merchants to stock and advertise certified items may be necessary. In some situations, certification systems could also offer monetary rewards to companies who implement sustainable practices or receive certification.

For businesses, accreditation has several advantages. Businesses that are certified can frequently reach out to new markets and clients who are becoming more and more interested in sustainable and ethical products. Businesses can reduce their environmental effect and enhance their sustainability performance through certification. As a result, there may be cost savings and increased efficiency. Moreover, stakeholder connections with people like employees, suppliers, and communities may also be strengthened.

The use of platforms for green certification is not without its difficulties, though. For some companies, particularly smaller ones, certification fees, for instance, may be a hurdle. However, not all types of agricultural or production techniques may be appropriate for the criteria and guidelines created by certification platforms, which may limit their applicability and influence. Also, there is a danger of "greenwashing," in which companies make false statements about their sustainability efforts or certification standing. This could diminish the certification platform's reputation and lessen the scheme's efficacy. Digital platforms for green certification have many safeguards in place to stop greenwashing, which is the practice of inflating or fabricating claims about an item's environmental advantages. The following are some ways that digital platforms for green certification aid in preventing greenwashing:

- Third-party verification is frequently used by digital platforms for green certification to confirm that goods and services adhere to the certification requirements. Third-party verification makes ensuring that the certification process is impartial and objective while assisting in the prevention of conflicts of interest.
- Transparency: Digital platforms for green certification are open and honest about their standards, criteria, and certification process. They are transparent about the restrictions placed on their certification and offer thorough information about how goods and services are assessed.

- Digital platforms for green certification educate consumers about the environmental advantages and restrictions of certified goods and services. This lessens the possibility of greenwashing while assisting consumers in making educated purchasing decisions.

3.2. Incentive system

Businesses are encouraged to implement sustainable practices and pursue green certification through the incentive structure of the business model of the existing worldwide green certification platforms. The incentive might take many different shapes, including monetary rewards such as banks offering low interest loan or government offers tax credits, marketing and branding assistance, and access to new markets and clientele. The offering of certification fee discounts or subsidies is one of the most popular types of financial inducement. For organizations, particularly smaller and medium-sized ones, that might not have the capacity to invest in sustainability practices without financial support, this might make certification more accessible and inexpensive.

Several certification platforms also assist certified businesses with marketing and branding, including the use of certification badges and emblems that can help customers distinguish certified items from uncertified ones. As a result, certified enterprises may have a competitive edge in the market and contribute to promote consumer trust in certified goods. By putting certified firms in touch with customers and merchants looking for ethical and sustainable products, this may make it easier for them to reach new markets and clients. This could assist accredited businesses in growing their customer base, diversifying their business, or opening new business options.

The possibility for improved stakeholder connections is another motivation of the business model of the current worldwide green certification platforms in the agriculture, food, and beverage industry. By demonstrating a commitment to sustainability and ethical practices, certification can assist in increasing confidence between organizations and their stakeholders, including customers, investors, and regulators.

Moreover, certification can enhance collaboration and communication within supply chains by establishing precise rules and directives that all parties can follow. This can save waste, boost system resilience, and improve supply chain efficiency and effectiveness.

In addition, few digital platforms for green certification include training and capacity-building programs to assist organizations in implementing sustainable practices and obtaining certification online. These programs can assist companies in acquiring the information, abilities, and tools necessary to put sustainability into practice and meet requirements. By offering this assistance, certification digital platforms can aid in removing entry-level obstacles that might impede some companies from implementing sustainable practices and applying for certification.

Last point: Employers that respect sustainability and ethical behavior can be attracted and retained by organizations that implement sustainable practices and certification. This may contribute to the development of a positive workplace culture and raise employee satisfaction, which in turn may promote higher output and creative thinking.

3.3. Pros and cons

By providing clear thresholds and guidelines for businesses to follow, certifying organizations can help user entities to reduce the negative impacts and promote sustainable practice in production. Also, having certification can build consumer trust in certified products and offer a competitive advantage for certified businesses in the market. This may increase market demand for sustainable and ethical products, and then open new opportunities for certified businesses.

Unfortunately, there are several difficulties and limitations with the present worldwide green certification digital platforms. The major barrier is the cost of certification, which might deter MSMEs from pursuing verification, particularly those in developing countries. Also, if the certification process or digital functions are difficult and time-consuming, it may be problematic for small enterprises. For instance, the app or website registration asks the applicant to register through email could cause many troubles for small business owners who less engage with emails rather registration using mobile phone number will be time saving and user friendly. Certification criteria should also be well aligned with the local environment regulations and there is a risk that some businesses may only pursue certification for marketing reasons rather than a sincere commitment to sustainability.

Limited access to certification and technology in some nations or industries is another drawback of the business model of the digital platforms now in use for green certification. For enterprises outside the industry, this may result in entrance obstacles that prohibit them from reaping the rewards of certification. Moreover, the power to enforce certification requirements may be restricted in some nations, which could result in non-compliance and reduce certification's ability to advance ethical and sustainable behavior.

Pros	Cons
Encourages sustainability: The business model of existing international green certification platforms in agriculture, food, and beverage sector encourages businesses to adopt sustainable practices, thereby promoting environmental responsibility and ethical business practices. Also encourage consumers for sustainable consumption.	**Cost:** The cost of certification can be a barrier to entry for smaller and medium-sized businesses, especially those in developing countries, and may prevent them from accessing the benefits of certification. **Sensitive data:** such as company annual income, profit, expenses for production, distribution, logistics, marketing, energy, transport, and overhead costs
Builds consumer trust: Certification can build consumer trust in certified products by providing assurance that they have been produced in a sustainable and ethical manner, thereby creating a competitive advantage for certified businesses.	**Complexity:** The certification process can be complex and time-consuming, requiring businesses to adhere to a range of standards and guidelines, which can create a burden for businesses with limited resources.
Provides market access: Certification can help businesses to access new markets and customers who are looking for sustainable and ethical products, thereby creating new business opportunities and increasing market demand for certified products.	**Limited effectiveness:** Some critics argue that certification may have limited effectiveness in promoting sustainability and ethical practices, as certification standards may not always be aligned with the local context, and some businesses may only seek certification for marketing purposes rather than genuine commitment to sustainability.
Improves supply chain efficiency: Certification can help to improve the efficiency and effectiveness of supply chains by providing clear standards and guidelines that all stakeholders can adhere to, thereby reducing waste and increasing resilience.	**Limited access to certification:** In some countries, certification may be limited to certain regions or industries, which may create barriers to entry for businesses outside these areas.
Creates cost savings: The adoption of sustainable practices and certification can lead to cost savings and efficiency gains for businesses, such as using energy-efficient technologies and practices or sustainable farming practices.	**Limited enforcement:** Enforcement of certification standards can be limited in some countries, which may lead to non-compliance and undermine the effectiveness of certification in promoting sustainability and ethical practices. **Pressure:** imposition by the bureaucratic authorities could be a pressure.

Section 4. The interface on data collection

The interface for data collection in green certification platforms for the agriculture, food, and beverage sector typically involves several key components. Firstly, there is often an online portal where businesses can register and submit their information for certification. This portal may also provide access to certification standards and guidelines, as well as training resources and support for businesses throughout the certification process.

Once registered, businesses are required to provide data on their operations and practices, which may include information on inputs such as fertilizers and pesticides, water and energy usage, waste management, and social and ethical practices such as labor conditions and community engagement. This data is typically collected through self-assessment questionnaires, on-site audits and inspections by certification bodies, and ongoing monitoring and reporting by businesses themselves.

To facilitate data collection, many green certification platforms use digital tools such as mobile applications, data management software, and remote sensing technologies to capture and analyze data. These tools can help to streamline data collection, reduce errors, and provide real-time feedback to businesses and certification bodies. If the certification platform developed its own digital tool all sets of data storage, domain, and systems should be well decided, purchased, and ready to use by the system developers. The information submitted by applicants is protected by secure data storage methods such as cloud-based storage. This is necessary to protect the data's confidentiality and to stop any illegal access, change, or dissemination. Digital technologies use a variety of security controls, including encryption, access controls, firewalls, and routine system updates and backups, to ensure secure data storage. In accordance with pertinent data protection laws and regulations in the country, the scheme owner should also implement data protection policies and processes.

The back-end data analysis process for digital platforms that offer green certification often entails a number of phases to categorize and analyze the data for different stakeholders, including validators, SMEs, third parties, or government organizations. Some of the typical steps are listed below:

- ➢ Data gathering: Gathering data from the company asking for certification is the first step. Data about their operations, supply chain, energy use, water use, waste management, and other sustainability-related information may be included.
- ➢ Data processing: Patterns, trends, and outliers are then discovered by processing the acquired data. This could entail applying statistical techniques to the data analysis or employing algorithms to find anomalies. This depends on what and how the platform owner wants to process and analyze the data. This can be identified after the scheme is ready and who the stakeholders will be.
- ➢ Data categorization: The processed data is then divided into various groups in accordance with the needs of the stakeholder. Data on energy use, for instance, may be divided into many energy categories, such as electricity, natural gas, or renewable energy.

- ➢ Data reporting and analysis: In order to give insights to various stakeholders, the categorized data is subsequently analyzed. SMEs may use the data to pinpoint areas where their sustainability performance needs to be improved, while validators may use it to evaluate the business' compliance with certification standards. The data may also be used for reporting and benchmarking by other parties and government organizations.
- ➢ Charts, graphs, and dashboards are examples of data visualization tools that green certification platforms may employ to present data in order to make it more comprehensible and accessible.

4.1. Method of collecting useful data

A key component of green certification digital platforms is data. The methods used to gather data depend on the platform's goals, however many techniques are frequently used to assess performance in terms of sustainability and ethics. The first approach is ***self-reporting***, in which companies use surveys, questionnaires, or other self-evaluation tools to disclose information about their performance in terms of ESG. This strategy, however, depends on companies reporting their performance truthfully, which can be difficult given the possibility of greenwashing.

Another approach is ***auditing***, where third-party verification body auditors audit and verify businesses' ESG performance and then input the result into the system. Installing ***remote sensors*** is also utilized to collect data (sensors can transfer data to the app system), which involves the use of technologies like satellite imagery, aerial photography, or unmanned aerial vehicles (drones) to find out more about land use, crop yields, and other sustainability and ethical performance indicators. This approach provides a cost-effective and non-invasive way to monitor performance, particularly in remote or hard-to-access areas.

Additional methods of collecting useful data in green certification platforms in the agriculture, food, and beverage sector may include:

- ***Life cycle analysis:*** A comprehensive assessment of the environmental impacts of a product or service throughout its life cycle, from raw material extraction to end-of-life disposal or recycling. The life cycle analysis is usually done by a specialized consulting firm or environmental assessment agency.
- ***Social impact assessments***: An evaluation of the social and economic impacts of a business's operations on its workers, communities, and other stakeholders.
- ***Traceability systems***: The use of tracking technologies like blockchain to monitor and verify the origin and movement of products and ingredients throughout the supply chain, ensuring sustainability and ethical standards are met.
- ***Continuous monitoring***: Ongoing tracking and reporting of sustainability and ethical performance metrics using automated sensors and software systems.

Other options for gathering information from different sources to support their efforts to obtain green certification:

- ➢ Obtain ***data on their energy, water, and fuel usage*** by asking their energy, fuel, and water distributors for this information. Some distributors might additionally provide real-time access to this information through web portals for SMEs.
- ➢ ***Waste collecting bodies***: By collaborating with waste collecting authorities, SMEs can gather information on their trash generation and disposal. These organizations can offer details on the kind and volume of waste produced, as well as information on how it is disposed of, which can be helpful in identifying areas that could be improved.
- ➢ ***Financial institutions:*** A few financial organizations may provide services relevant to sustainability, such green loans or sustainable investment alternatives. SMEs can collaborate with these organizations to gather information about their sustainable performance and pinpoint areas for development.
- ➢ ***Tax and customs offices***: In some circumstances, SME reporting requirements may include providing information on their environmental impact. SMEs can use this data to monitor their sustainability performance and pinpoint areas for development.

These methods may be used in combination with each other or with the four main methods listed earlier to provide a more comprehensive and accurate assessment of sustainability and ethical performance in the agriculture, food, and beverage sector. All these methods for gathering or pulling data from other sources are possible in terms of technology development if these data providers develop API for their system, which makes the data exchange possible in the app or website development stages. If these data providers do not support the API this will be troublesome for the SOGE platform app developers to make the data exchange plausible..

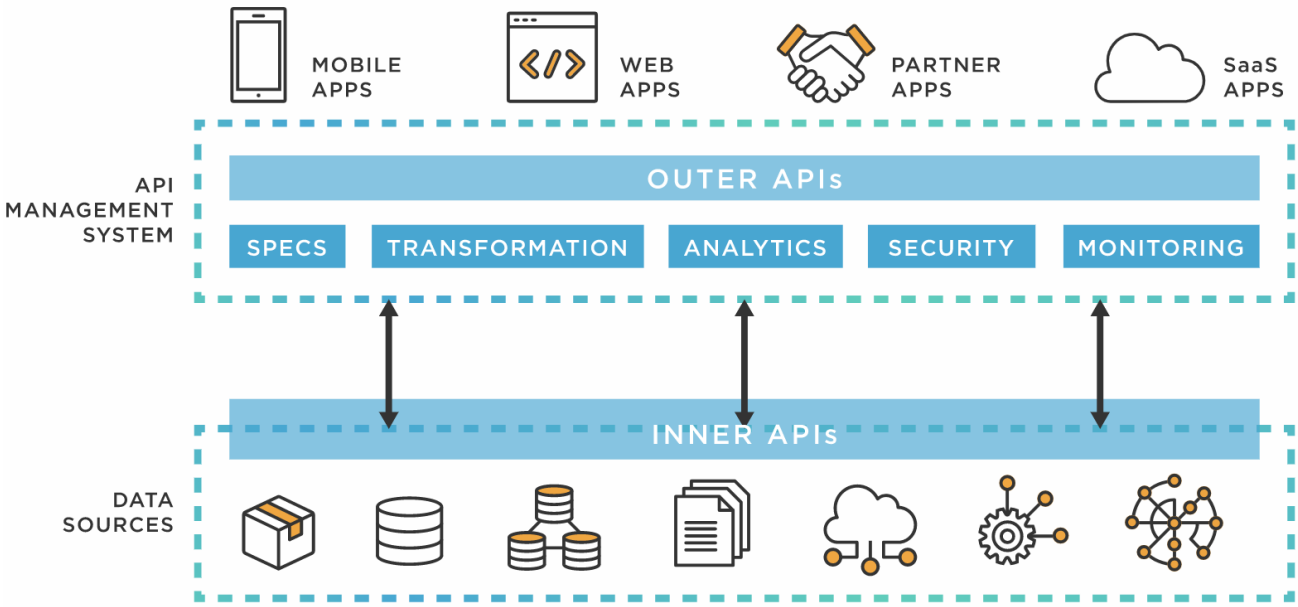
4.2. Integration with other platforms

Platforms for green certification can connect to different additional platforms and systems to increase their functionality. Traceability systems, which enable the monitoring and tracking of items from farm to customer, are one potential interface. Green certification platforms may make sure that certified items are appropriately labeled and validated across the supply chain by integrating with traceability systems. Consumers who can easily obtain information about the origin, quality, and environmental impact of the products they buy are more transparent and more likely to trust businesses.

By offering useful information on the environmental effects of agricultural operations, traceability systems can also aid in enhancing the efficiency of green certification platforms. Traceability systems can give a thorough picture of the environmental effects of various farming techniques by monitoring the usage of pesticides, fertilizers, and other inputs. In order to encourage more ethical agricultural methods and lessen the influence of the agriculture, food, and beverage industries on the environment, green certification platforms can use this data to establish standards and criteria for sustainable agriculture.

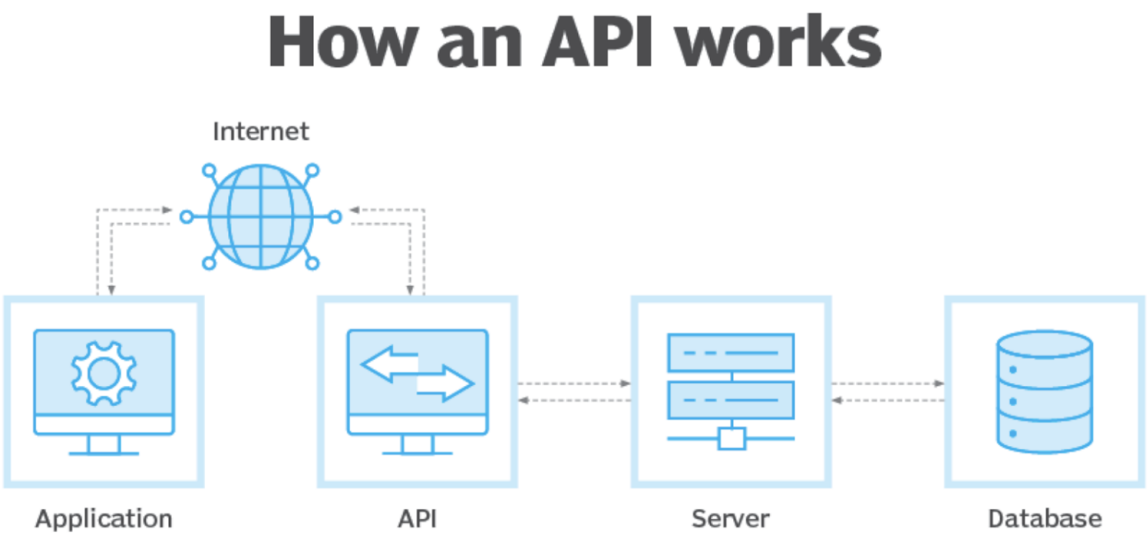
Digital platforms for green certification can incorporate data from government agencies, such as information on water and power use, via APIs. By doing this, they may give companies a more complete picture of how well they perform in terms of sustainability, enabling them to pinpoint

areas for improvement and come to data-driven conclusions about how to lessen their environmental effect. For instance, a platform for green certification might use an API to link with water usage statistics from a government body. The platform could then automatically import information about the company's water usage from the database of the regulatory body, enabling the company to track and report on its water usage in real time.



Example image of how APIs work

Similar to this, a platform for green certification may use an API to link with statistics on electricity use from a government body. The software could then automatically import the company's electricity usage data, enabling the company to keep track of, report on, and spot chances to increase energy efficiency. Green certification platforms may give businesses a more precise and thorough view of their sustainability performance by integrating with data from government agencies through APIs. This enables them to make more educated decisions about how to lessen their environmental effect.



Blockchain technology is another potential tool for green certification digital platforms. This technology offers safe and decentralized methods to store and share information on the certified products. Green certification systems may make sure that the data collection and exchange is unchangeable and available to the consented parties by utilizing blockchain. This can help to improve overall certification process effectiveness and lower the possibility of fraud or misrepresentation.

Moreover, digital platforms may interface with sustainability reporting systems to help organizations track and report on their environmental, social, and governance performance. By linking with these systems, green certification digital platforms can provide organizations with a fuller picture of their sustainability performance, allowing them to identify areas for development and track progress over time. Businesses may be more likely to adopt sustainable practices and take part in green certification programs as a result.

To support alignment and consistency in certification criteria and requirements, green certification digital platforms can interface with certification bodies and related standards organizations. Green certification digital platforms can collaborate with these groups to develop best practices for sustainable agriculture and make sure that certification programs are respected and acknowledged all around the world.

Section 5. Green certification platform uses and operation

Apps for green certification are used by companies and organizations to assist them get eco-certifications for their goods and services. These apps frequently provide a variety of features to help with the certification process, such as instructions on certification standards, instruments for gathering and analyzing data, and assistance with filing certification applications.

Small and medium-sized businesses (SMEs), major corporations, government organizations, and other parties involved in the certification process can all use green certification apps. Larger firms may use the applications to manage certification requirements across numerous facilities or product lines, while SMEs may use them to gather and submit data about their environmental impact.

Green certification applications may give users access to resources and tools for sustainable company practices in addition to making the certification process easier. For instance, some apps may provide instructions on cutting waste or carbon emissions as well as tools for monitoring progress toward sustainability targets. Specific examples including EcoVadis, LEED, and GOTS are explained in detail earlier in this report.

Depending on the particular app and its features, there can be differences in the technical components of how green certification apps function. However, the following are some broad technical justifications for typical features:

- ☐ Data gathering: Green certification apps get data from a variety of sources, including manually entered information from users, APIs connected to databases maintained by outside organizations or by the government, and sensors that track the use of energy, water, and waste.
- ☐ Data storage: Depending on the infrastructure of the app, the gathered data is safely kept in the app's database or on a cloud server. To guarantee data security and privacy, the data may be encrypted.
- ☐ Data analysis: To assess the SME's environmental performance in relation to the pertinent sustainability requirements, the app's algorithm analyzes the data that has been collected. The software may also employ machine learning strategies to enhance the analysis's accuracy over time.
- ☐ The app provides a certification report that SMEs may use to show that they are in compliance with the sustainability criteria based on the analysis results. The report can be distributed to the appropriate parties, including clients, investors, and regulatory agencies.
- ☐ Continuous monitoring: To follow the SME's environmental performance over time, certain green certification apps additionally offer continuous monitoring services. Alerts for anomalous energy or water use, problems with compliance, or possible environmental dangers might all fall under this category.

In general, green certification apps enable SMEs to monitor and enhance their environmental performance by combining data collecting, storage, analysis, and reporting functions. The

correctness and dependability of the data entered into the system are crucial to how these operations work. The output that the system produces won't be helpful or trustworthy if the data isn't accurate or reliable. Additionally, since the data being collected might include sensitive information about the businesses or people involved, the security and privacy of the data are also important considerations. To protect the accuracy and privacy of the data, it is crucial for green certification apps to have rigorous data validation procedures and strong data security measures.

5.1. Other platforms

Apart from the green certification apps and platforms utilized in Asia and Europe, the US has several other digital platforms that advocate for sustainable practices. These are a few instances:

1. Leadership in Energy and Environmental Design (LEED) - The U.S. Green Building Council (USGBC) developed this platform. It is a well-recognized rating system assessing the sustainability of buildings. The digital platform provides different certification levels, including Certified, Silver, Gold, and Platinum, to help evaluate and certify the ESG performance of construction.
2. Green Globe Awards - Green Globes, a web-based program that awards green building certifications evaluating a construction facility’s environmental sustainability and offering recommendations for enhancements. Construction buildings are assessed and certified using a digital platform by the program's owner, the Green Building Initiative.
3. Energy Star - The United States Environmental Protection Agency (EPA) created the Energy Star, which accredits construction buildings that consume less energy. The program certifies participants for energy efficiency by using a digital platform.
4. Life Building Challenge (LBC) - The International Living Future Institute's LBC certification uses a list of thorough set of requirements, including social justice, water conservation, and energy efficiency. The digital platform is used to analyze and certify projects that adhere to the LBC requirements.

These are solely a few examples of digital platforms in-use in the US that issue green certification online. Using digital platforms and certificates, many other additional organizations and certification programs are promoting sustainable behaviors and lowering negative environmental effects.

5.2. Lessons-learned

The digital platform utilized for green certification can provide us with a diverse range of results. Those are the checklist that can be referred as lessons-learned:

A. Green certification digital platforms can support good ESG practice by offering a transparent and specific framework for assessing and certifying sustainable actions. They can aid entities and individuals in making better decisions and minimize negative effects on the environment.
B. Standardization is crucial - green certification digital systems require established threshold and criteria to guarantee consistency and comparability. As a result, stakeholders may compare the sustainability of various initiatives and goods, which enforces the market embrace green certification.
C. Cooperation is essential. Green certification digital platforms should be developed in collaboration with key stakeholders, such as business and certification experts, governmental organizations, IT developers, and user groups. This makes it easier to guarantee that the digital certification procedure is reliable, open, and considerate of the capabilities of all participants.
D. Education and training are crucial – It is important to offer stakeholders training to assist them to understand the process and requirements of green certification digital tools. This can include instruction on how to use the platform and what the sustainability principles are for certification.
E. Verification and auditing are required - To make sure that sustainability claims are accurate and trustworthy, verification and auditing should take place for products or services. This ensures that certified projects and goods are sustainable and contributes to maintaining the integrity of digital tools for green certification.

These lessons can be used to direct the creation of new digital platforms for green certification and improve the efficacy and legitimacy of already existing ones.

5.3 Generating the data

For green certificate platforms in the food, beverage, and agriculture industries to be effective, the data must be reliable and accurate. Data must be gathered from a variety of sources, including test reports, product certifications, and farm audits. Depending on the particular certification program and its requirements, the sorts of raw data that green certification apps get can change. Typical data types that might be gathered and analyzed include

I. Financial statements and records can be used to evaluate the company's financial sustainability and to confirm that any financial requirements of the certification program have been met. To evaluate the financial stability of the company, this data can be studied using a variety of financial analysis methodologies.
II. Organizational diagrams and documents can be utilized to comprehend the management and structure of the company as well as to spot any potential hazards or trouble spots in terms of governance or operations.

III. Documentation pertaining to eco-transitioning - this could include records of energy or water use, waste management techniques, or other sustainable practices as proof of attempts to lessen the environmental impact of the firm.
IV. Other pertinent documents may also be requested, such as licenses or permits, product specifications, or safety records, depending on the particular certification scheme.

On-site farm audits are one way of gathering data. Auditors inspect farms and evaluate a number of operational factors, including soil management, water use, and energy use. The information gathered from these audits is then inputted into the platform for green certificates, where it can be examined and measured against industry standards. This approach to data production offers a thorough analysis of a farm's sustainable practices and can identify opportunities for development.

Product certifications are another way to produce data. Consumers can be sure that a product has been made in a sustainable and ecologically friendly way thanks to these certificates. The green certificate platform receives data on the certification, which enables businesses to monitor their development toward sustainable objectives and pinpoint areas for development.

Data generation in systems for green certificates can also be done using laboratory results. These findings can reveal details on the nutrient composition of the soil and water, the use of pesticides, and other environmental aspects that affect the sustainability of farms. This information is used to monitor and track the evolution of environmental conditions over time and to pinpoint areas in need of improvement.

Generating data in green certificate platforms involves several steps that ensure the accuracy and reliability of the information being collected. Below are some of the steps involved:

1. Defining the scope and objectives: The first step is to define the scope and objectives of the data collection process. This involves identifying the parameters to be measured, the frequency of data collection, and the sources of the data.
2. Selecting the appropriate methods: The next step is to select the appropriate methods for collecting the data. This may involve the use of surveys, interviews, observations, and other data collection techniques.
3. Developing the data collection tools: Once the appropriate methods have been selected, the next step is to develop the data collection tools. This may involve designing questionnaires, interview protocols, and other data collection instruments.
4. Testing the data collection tools: Before implementing the data collection process, it is important to test the data collection tools to ensure that they are effective in collecting the required data.
5. Implementing the data collection process: Once the data collection tools have been developed and tested, the next step is to implement the data collection process. This may involve training data collectors, conducting the data collection process, and ensuring that the data collected is accurate and reliable.

6. Cleaning and analyzing the data: After the data collection process is complete, the data needs to be cleaned and analyzed. This involves identifying and correcting any errors in the data and analyzing the data to generate meaningful insights.
7. Reporting the findings: The final step is to report the findings of the data collection process. This may involve generating reports, visualizations, and other forms of communication to share the insights generated from the data.

In conclusion, generating accurate and meaningful data is crucial to the success of green certificate platforms in the agriculture, food, and beverage sector. Through on-site farm audits, product certifications, and lab results, these platforms can provide businesses with valuable insights into their sustainability practices. By analyzing this data, businesses can make informed decisions and take action toward more sustainable and environmentally friendly operations.

Section 6. Platform development roadmap and recommendations

6.1. Design plan

Based on our study research, here is a recommendation for a design plan for a green certification digital platform in Mongolia. The project team should highly consider the following things when developing the platform.

1. **Goals** - Describe the goals of the platform, whether it is promoting environmentally friendly behaviors, reducing its negative effects, or boosting economic growth.
2. **Establish schemes and specific metrics** for evaluating and certifying sustainable activities in production. The criteria should consider the country's opportunities and threats, such as the rural setting, environmental issues, and cost capabilities.
3. **User Interface** – Design an easier user interface (app screen and process) simple enough for entities and individuals to access information, use the platform, and submit certification applications. Hiring UX/UI design company is a critical point here before starting the coding part. Once the app screen and process design are ready the coding part can be accelerated.
4. **Data Collecting and Management** - Develop a system for collecting, managing, and storing data on products, services, and companies that have been certified, including verification and auditing information. Coding developers will provide a clear idea of how it can be done and what developments are necessary.
5. **Certification Process** – On a digital platform whether it is an app or web-based tool create an application form, review, and approval staged certification procedure. Transparency, consistency, and credibility are essential in the process. However, the process of IT development can only be explicit after the scheme, its criteria, and its process are ready to map out for IT development.
6. **Functions and activities:** How the app should look like and what features and functions it should include will comprehensible after the scheme criteria and process, and how IT developers can code all of these into programming depends on their capability.
7. **Education and Training** - Offer entities and individuals training on how to use the platform successfully and embrace sustainable practices for certification. Including videos and documents on the app is totally possible..
8. **Promote collaboration and partnerships** between government organizations, corporations, and civil society to advance sustainable development in Mongolia.
9. **Ongoing Improvement** - Review and update the platform on a regular basis to make sure it reflects technological improvements and sustainability best practices and continues to be useful and successful.

10. **Promotion and Outreach channel** - To increase awareness and promote adoption, promote the platform and its approved projects and products through outreach initiatives like events, social media, and advertising.

6.2. Cost of the app development

A number of variables, like the complexity of the app, the features needed, the platform it is designed for, the hourly rate of the development team, and the project timetable, can greatly affect the cost of producing a green certification app.

A straightforward app with fundamental functionalities often costs between $10,000 and $50,000. A complicated software with third-party system integrations and more functionality, on the other hand, can cost upwards of $85,000 to $100,000 or more in Mongolia. It is advisable to speak with a well-experienced app development business to receive a precise cost estimate based on your unique needs and spending limit.

It's vital to remember that the cost of the app may increase with continued upkeep and upgrades. The costs of integrating the app with external APIs and databases, acquiring required certifications and licenses, and guaranteeing compliance with data privacy and security laws may also be included.

The following maintenance expenses for a green certification app should be taken into account:

	Service	Explanation	Cost amount (estimate)
1	UX/UI design	**One-time** contract with an experienced design company.	$6,000
2	IT development/coding	After the design is ready front-end and back-end codes should be built. **One-time** pay could be set as.	$60,000
2	Server hosting and maintenance	This covers the price of cloud hosting, server upkeep, and security patches.	
	Apple developer account	**Yearly** rate to place the app on the App store. Iphone users will use the Appstore to download the app.	$99
	Google developer account	**One-time** payment to place the app on Google store. Android users will use the Google store to download the app	$25

	.mn domain	Any Mongolian company who wishes to use XXXX.mn domain needs to pay a **yearly** payment to iTools company	$40
	Server (Amazon etc.,)	It depends on the data set capacity however, the average estimate for **yearly** service for a small company can be set for USD10,000	$10,000
2	Technical support	This includes giving app users ongoing technical help. The average monthly maintenance fee for an IT company could be set based on how the contract is set.	$1,400
3	Bug fixes and software updates	As with any software, the app may experience flaws and issues that call for fixes and upgrades to keep it operating correctly. (Version 1,2,3 etc.,)	depends on the fix and updates. Ex: $500-$2,000
4	Content updates	There can be expenses involved with creating and releasing educational content,, or other information that needs to be updated frequently if the app contains it.	depends on the content. Videos could be hard to add and update. Should be negotiated with the IT company.
5	3rd party integrations (APIs)	There can be expenses involved with maintaining third-party tool or service integrations if the app depends on them.	Should be negotiated with the IT company.
6	Marketing and promotion	The costs of promoting the app to potential users may be ongoing, depending on the goals of the app.	Should be negotiated with the IT company.

6.3. Business model

A digital platform in Mongolia for green certification could include a variety of revenue sources as its foundation, including:

1. Certification Costs - The platform might charge organizations and people seeking green certification fees. Depending on the project's complexity, the size of the company, and the type of certification, the fees may change.
2. Subscription Costs - The platform might charge a fee for users to access certain services, like data, resources, and support. The subscription costs could be assessed annually or monthly.
3. Data and Analytics Services - The platform might offer data and analytics services to companies and organizations looking for information on best practices and emerging trends in sustainability. This might be provided separately or as a perk of a subscription plan. Some apps are made to work with other software programs, like accountancy or customer relationship management (CRM) programs. This can facilitate the analysis and processing of data across many systems. Business Intelligence (BI) tools are also made to assist companies with data analysis and visualization. In addition to creating reports and dashboards for decision-making, they can be used to find trends and patterns in data.
4. Consultation Services - The platform might provide advisory services to companies looking for advice on how to adopt sustainable practices and acquire green certification. This might involve on-site evaluations, instruction, and assistance.
5. Advertising and Sponsorship - The platform could make money by highlighting certified projects and products on it or by collaborating with companies and organizations that promote sustainable development in Mongolia.
6. Funds and donations - The platform may also look to receive funding from governments and international organizations that support it.

In general, the business plan for a green certification digital platform in Mongolia will depend on the particular features and services provided, as well as the target market and competition. Yet, a mix of income sources, such as certification fees, membership fees, and advisory services, might support Mongolia's sustainable development while also ensuring the platform's long-term financial and functional stability.

6.4. Fundamental features

A digital platform for green certification in Mongolia should contain the following essential attributes:

1. **Certification application and other processes** - The platform should offer an easy-to-use certification application and approval procedure for both the applicant and auditors. The whole process for all stakeholder users should be transparent and clear. A visible emblem (certification logo) will be good to present on the users' profile sections on the app. Easy fee payment function should be developed for the app.
2. **Easy navigation** - The platform should have a user-friendly interface that is easy to navigate and allows users to access information, submit applications, and track progress. Also, the platform must be usable on a variety of gadgets, such as tablets and mobile phones. Easy app registration, pushing apply button, uploading the necessary files, and submitting documents are all examples of user-friendliness.
3. **Database of Certified Projects and Goods** - The platform needs to keep track of a database of certified projects and goods that can be consulted by organizations and people looking to embrace sustainable practices. The database needs to have details on certification requirements, the certification procedure, and the verified outcomes.
4. **Educational Materials** - The platform should offer educational resources to assist organizations and people in understanding and implementing sustainable practices, such as training manuals and case studies. All users, from novices to professionals, should be able to access the resources. Training and tips on adopting certification, soil management, water use, and energy efficiency etc., could all be included in the app by category.
5. **Data Collecting and Analysis** - The platform should have a system for gathering data and analyzing it that enables organizations and people to gauge and monitor their advancement toward sustainability objectives. The system should include analytics. Certification status check will be a key function for the users to follow-up and plan for advancement.
6. **Cooperation and Networking** - The platform should offer chances for networking and collaboration among companies, groups, and people interested in Mongolia's sustainable development. These can include message boards, social gatherings, and teamwork applications. Connecting with the auditor and scheduling the on-site inspection day would provide time saving and convenient process for the applicant.
7. **Support Services** - The platform should provide technical assistance, consulting services, and mentoring to assist organizations and individuals during the certification process. The call center button for example should be ready for the finger touch if the applicant or auditor is lost with the processes. Complains and disputes can also be solved through support service section on app or website of the certification and it will accelerate the issue fix or immediate correction regarding the certification procedure or app issue.

6.5. Infrastructure

A green certification platform should have an intuitive, user-friendly interface that is simple to use and understand. This contains clear instructions for each step of the certification process, as well as useful resources and support.

Integration with existing systems: A green certification platform should integrate with existing systems, such as accounting or procurement software, in order to allow users to quickly upload pertinent data. This will make the certification process as simple as feasible.

Safe Data Management: To safeguard users' sensitive data, the platform needs to implement secure data management procedures. To stop unwanted access, this involves utilizing encryption and multi-factor authentication.

Transparent Certification Process: Transparency is key in the certification process. The platform should provide clear information on the certification criteria and how it is determined, as well as any fees or costs associated with the certification.

The system architecture of a green certification digital platform is typically composed of multiple layers and components that work together to support the platform's core functionality. Here is a general overview of the typical system architecture for a green certification:

- ➔ Presentation Layer: This layer represents the user interface of the platform, which includes the web pages, mobile apps, and other user-facing components. It provides a user-friendly interface for interacting with the platform and displaying information.
- ➔ Application Layer: This layer is responsible for handling the core business logic of the platform. It includes various modules and components that perform functions such as data validation, processing, and reporting. It also integrates with external systems, such as databases and APIs.
- ➔ Data Layer: This layer stores the platform's data, including user profiles, certification data, and environmental data. It includes one or more databases that support data storage and retrieval and provides a reliable and scalable data management system.
- ➔ Integration Layer: This layer is responsible for integrating the platform with external systems, such as third-party certification bodies, environmental monitoring systems, and other data sources. It provides a way for the platform to access and process data from these systems, and to send data back to them as needed.
- ➔ Security Layer: This layer ensures the security and integrity of the platform and its data. It includes various security measures, such as encryption, access control, and authentication, to protect against data breaches and unauthorized access.
- ➔ Analytics and Reporting Layer: This layer provides data analysis and reporting capabilities to the platform. It includes tools for generating reports, visualizations, and other analytics

that can help users understand their environmental performance and identify areas for improvement.

Overall, the system architecture of a green certification platform should be designed to be scalable and reliable.

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