



SNAPTAG Introduction

#InvisibleWatermark #Security #AI #IP Authentication #Digital Check in
#Authentication

SNAPTAG Co., Ltd.





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Company and Technology Introduction

- **1-1. SNAPTAG Introduction**
- **1-2. Invisible Watermark Introduction**
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1-1. SNAPTAG Introduction

SNAPTAG is the only company in South Korea to commercialize invisible watermarking technology, and we have been researching this technology for approximately nine years since 2015. SNAPTAG's invisible watermarking technology has obtained numerous patents both domestically and internationally, and our technological prowess is recognized through partnerships with major corporations



SNAPTAG aims to be the global technical standard for invisible watermarks



Name of Company
SNAPTAG Inc.



Major Technology
Invisible Watermark



Date of Establishment
September 11, 2020



Period of Technology Development
9 years of technological research and development from 2015



CEO
Min Kyung-woong



Patent and Public Institution
Patent: Domestic and international registration
Procurement Service: Registration at G2B(Venture Nara)

1-1. SNAPTAG Introduction

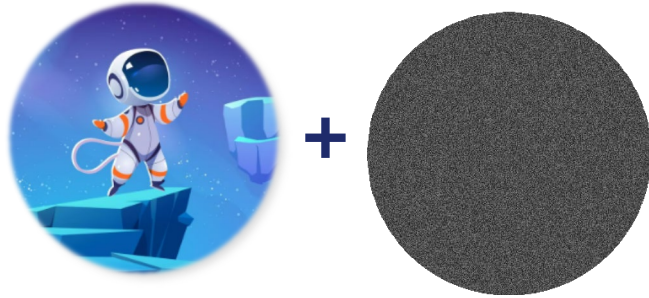
SNAPTAG's core technology, the invisible watermark, holds numerous patents both domestically and internationally. While invisible watermarking may appear to be software technology, its foundation lies in the core principles of physics and color science research based on the Human Visual System. **Based on these patented technologies, it is impossible to surpass or bypass SNAPTAG's invisible watermark technology solely through software development.**

- ✓ **Venture company certification**
'Venture Investment Type' sector
- ✓ **Registered in G2B(Procurement Service)**
'LAB Guard, IP Authentication Solution'
- ✓ **Registration of 1 patent in China**
- ✓ **Registration of 1 patent in Japan**
- ✓ **Registration of 4 patents in U.S.**
- ✓ **13 patent registrations at home / 5 applications**
- ✓ **GS certification completed - Grade 1**
- ✓ **2024 Information Security Product Innovation Award - Minister of Science and ICT Award : 'LAB Guard-M'**



1-2. Invisible Watermark Introduction

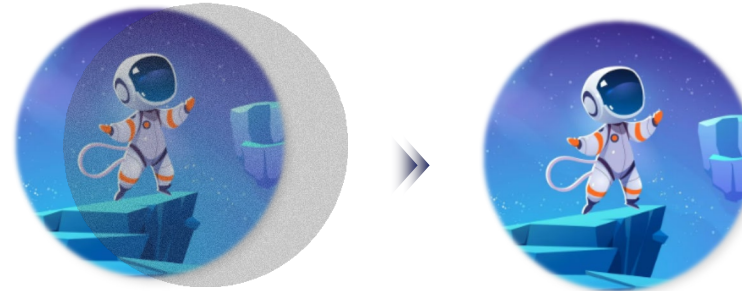
SNAPTAG's patented technology, the invisible watermark, is a technique that invisibly links data to images and videos, enabling seamless data input without alteration or damage, and effortless data verification.



Original Image

Data

We generate data into the invisible watermark, utilizing 258 distinct identification codes to encapsulate a wide range of information, including individual details, URLs, content data, product information, and more.



Invisible Watermark Application

Completion

It applies the invisible watermark to the original image. The applied image is not much different compared to the original.



Digital Content Connection

You can retrieve the data by scanning it using a detection module, a website, a dedicated reader, or a smartphone.

1-3. Essential Requirements for Invisible Watermarks

Visible watermarks can be created, removed, and altered by anyone, leading to the proliferation of fake news. For this reason, big tech companies are developing invisible watermarks. **Invisible watermarks require the following five essential conditions, all of which are uniquely met by our technology.**

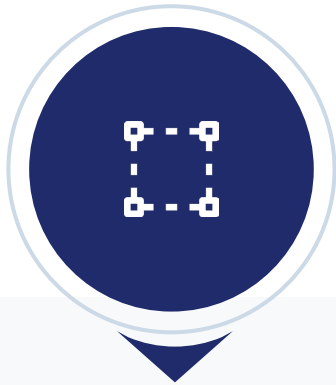


Image quality

The visual difference between images before and after watermark application is indistinguishable.



Robust

Maintaining its functionality even after image compression, alteration, cropping, rotation, and other edits.



Secure

Watermark generation and verification will only be possible through designated modules.



Authentication

Verification and authentication can be performed solely based on the watermarked image itself with a 100% success rate.



Identification

The watermark will have a unique identification code, allowing for distinct differentiation between each watermark.

02

Invisible Watermark Introduction

- **2-1. Special Features of Invisible Watermark**
- **2-2. Flow of Application**
- **2-3. Offline Application Workflow**

2-1. Special Features of Invisible Watermark

We introduce the distinctive advantages of SNAPTAG's proprietary invisible watermark technology. It overcomes the limitations of conventional codes by using codes that are invisible to the naked eye, and it possesses unmatched features compared to competitors.



Invisible

Unlike QR code/hologram, there is no need for a separate print/attachment/form/design change.

Same design/form as the previous product of the code insertion.



High Damage Recognition Rate

The watermark is repeatedly inserted into the entire content, allowing recognition even in a 20mm x 20mm image.

specially in forensic cases, you can extract information using just one code from a set of 256 x 256 pixel codes.



Ease of technology utilization.

Easily apply the technology through SDK, API and a dedicated website.

The technology can be easily verified and integrated with various customer services using the same method, and it can be recognized through the camera using the mobile phone SDK.



Offline implementation.

Printing digital content into various offline materials for consistent functionality.

It does not require additional manpower or equipment investment as it can be applied to various printing methods, from offset printing to digital printing.



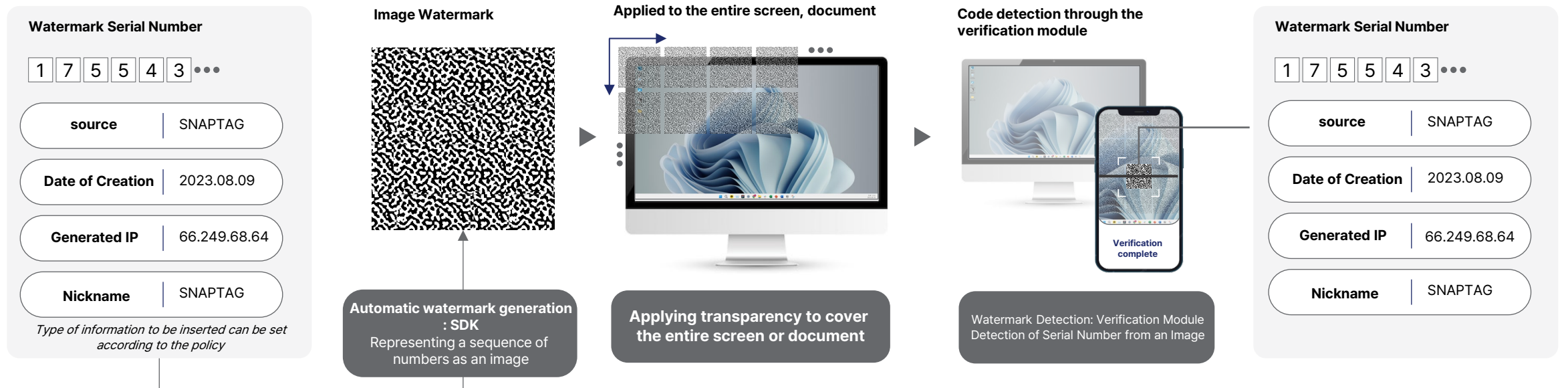
Enhanced Security

By applying 2^{58} variable codes, unique codes can be assigned to individual content, allowing for separate authentication.

2-2. Flow of Application

Invisible watermarking encodes user and timestamp information into a serial number and generates an image.

The generated image is layered transparently over the entire screen or document.



- ✓ Using an SDK to convert a sequence of serial numbers (258 in total) into watermark images (creating the watermark).

- ✓ The generated invisible watermark is automatically applied to the content. (In the case of 1080p resolution, approximately 700 or more codes are applied.)

- ✓ Utilizing the verification module (SDK) to read and interpret the watermark image → Extracting watermark serial numbers

- ✓ The information extracted from the serial numbers allows for the identification of each piece of content.

2-3. Offline application Workflow

The invisible watermark can mass-produce as the existing process of printing because there is no additional input of investment or resources in the process of printing. Also, it is possible to perform offset printing, digital printing, etc. and it can be applied to various materials.



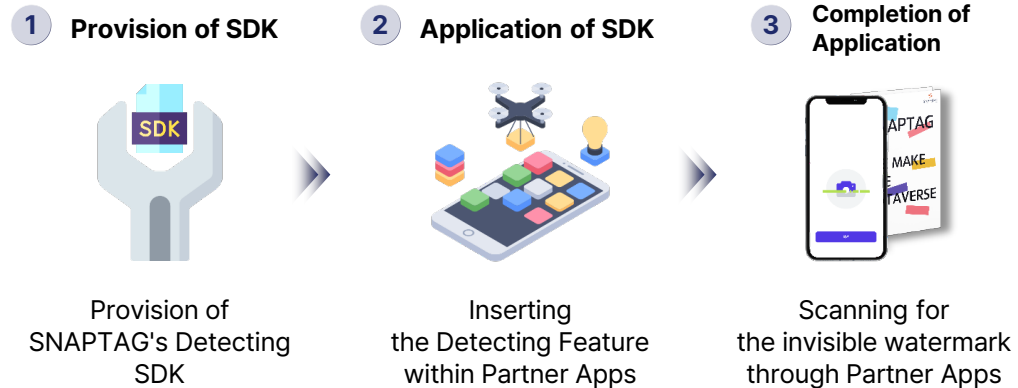
2-3. Offline application Workflow

We offer a variety of methods for providing the invisible watermark detection feature, regardless of the presence of partner apps. In cases where partner apps are not available, we provide the SNAPTAG app. For partners with their own apps, we offer an SDK that enables scanning within the partner's app.

Flow of SDK Application

Provision of SDK

*SDK: The source that allows to create applications for a particular operating system



* SNAPTAG Synergy

- Increase in traffic of partner company's application
- User Lock-in by inducing the use of partner company's application.

The Flow of Utilizing the



Use of SNAPTAG Application

Scanning/Recognizing the invisible watermark with the SNAPTAG App.



Converting the SNAPTAG App

We create and provide SNAPTAG's app as a partner's application. With this application, you can scan/recognize the invisible watermark.



LAB Guard

- **3-1. Overview**
- **3-2. Solution**
- **3-3. Verification Model**
- **3-4. Reference**



LAB Guard is a security solution based on the invisible watermark.

When LAB Guard is executed, the invisible watermark is layered on the top of the screen and the entire printout.

The user and leakage information can be checked through the dedicated verification module.



LAB Guard-M
In-App Screen Security Solution



LAB Guard-S
PC Screen Security Solution



LAB Guard-P
Printout Security Solution



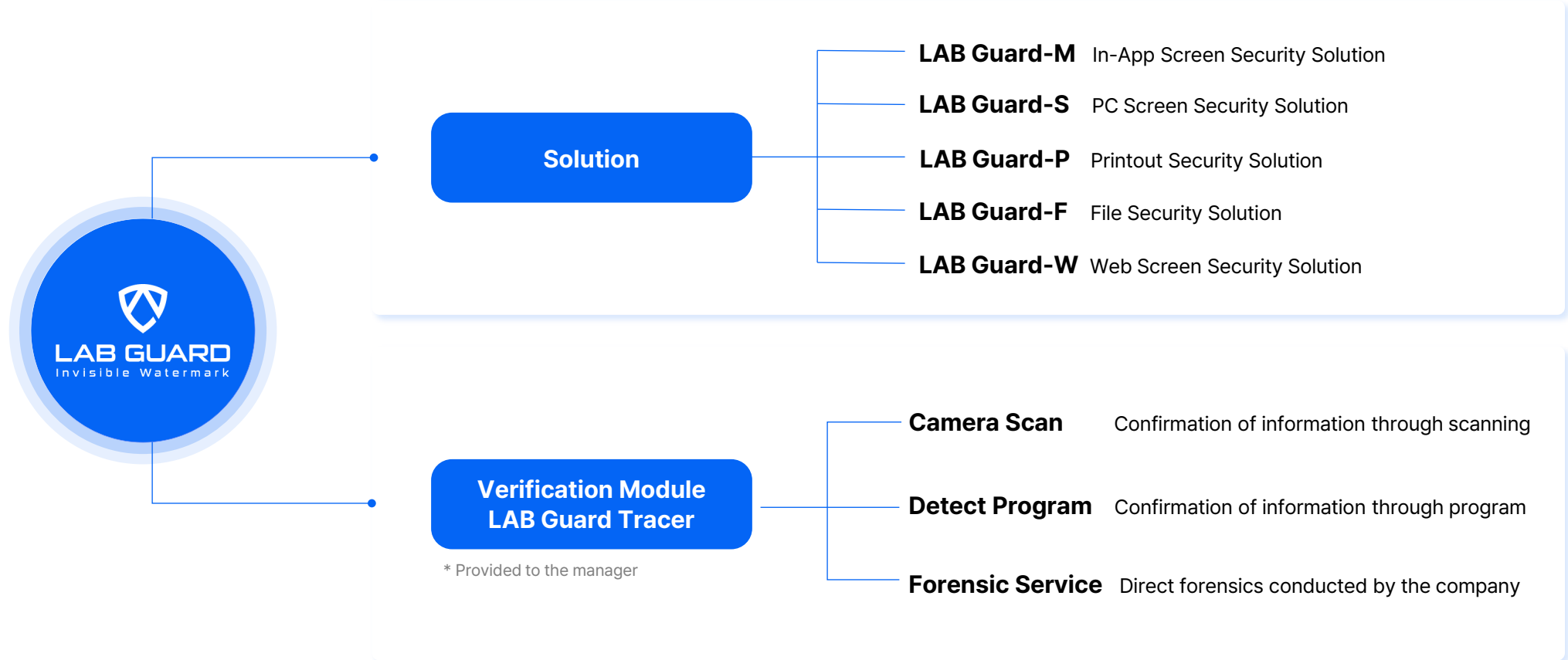
LAB Guard-F
File Security Solution



LAB Guard-W
Web Screen Security Solution

3-1. Overview | LAB Guard Solution Configuration

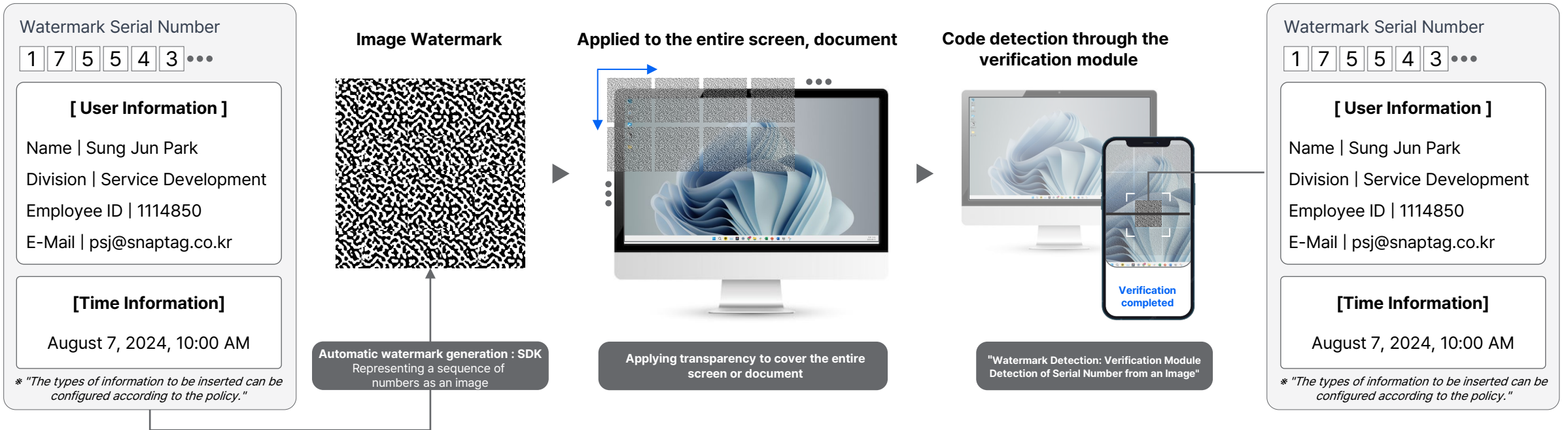
LAB Guard consists of the solution to which the invisible watermark is applied, and a verification module that tracks and verifies data.



3-1. Overview | Process of applying an invisible watermark

Invisible watermarking encodes user and timestamp information into a serial number and generates an image.

The generated image is layered transparently over the entire screen or document.



✓ Using an SDK to convert a sequence of serial numbers (58bit About 280 quadrillion) into watermark images (creating the watermark).

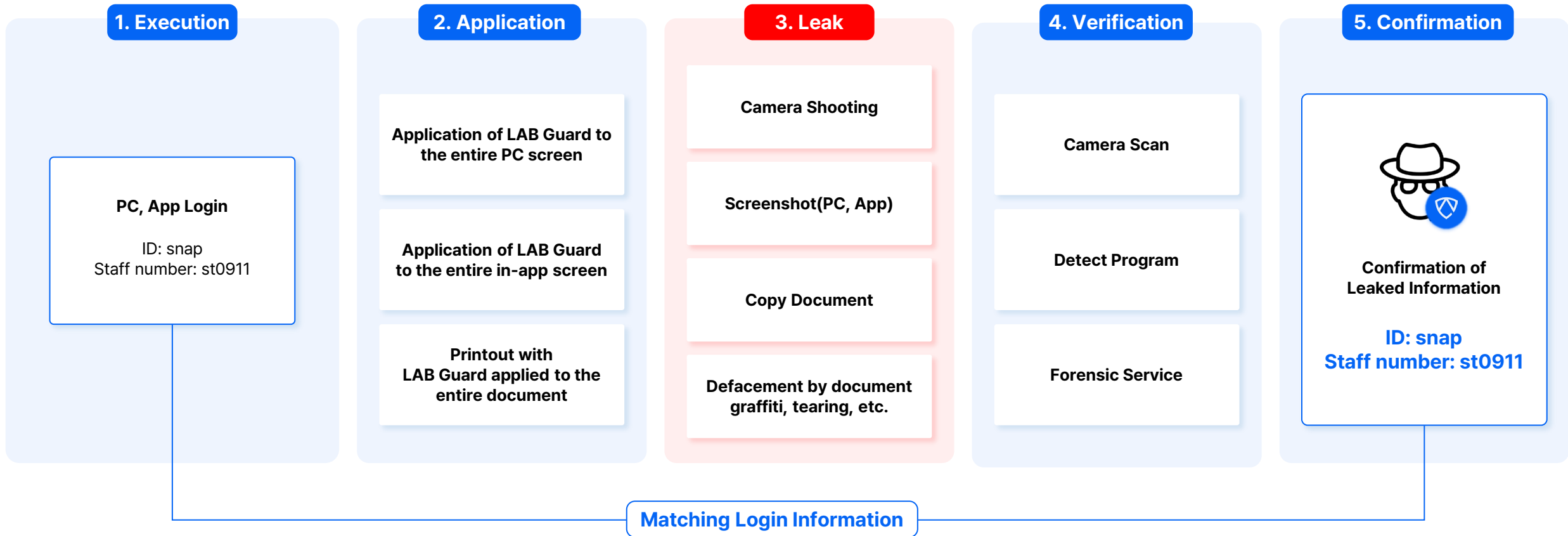
✓ Adjusting the watermark transparency and applying it to the entire screen or document
** The visibility and recognition rate of the watermark change according to the transparency.**

✓ Inserting over 700 codes onto a typical monitor screen
→ Detection possible if only 1 out of 700 codes is found.

✓ Even in secondary or tertiary leaks, such as photographing, it is possible to detect and locate a single code within the image.

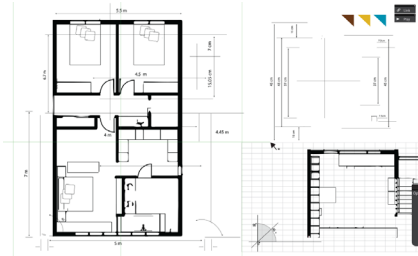
3-1. Overview | LAB Guard Solution Process

LAB Guard solution runs automatically when logged in. It can track the leaked information based on the information entered in the invisible watermark when applied to the screen and the entire document.

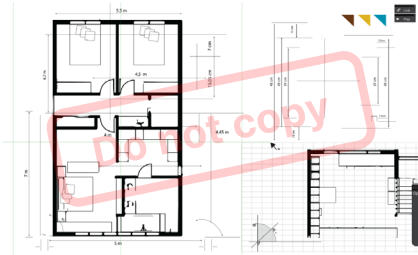


3-1. Overview | LAB Guard Features

Image of the original



Basic watermark



Invisible watermark concentration - low



Invisible watermark concentration - middle



1 Decrease of user fatigue due to the invisible watermark

1 Unlike traditional watermarks, it is invisible to the eye, so it can increase the efficiency of the work while reducing the user's fatigue.

2 The invisible watermark without blind spots

2 Accident leakage between the watermarks can be prevented because the invisible watermark is applied to the screen and the entire document.

3 Adjustment of security strength according to the degree of watermark concentration

3 The stronger the invisible watermark concentration, the easier it is to track leaks, so security can be enhanced. It is possible to adjust the security intensity by adjusting the watermark concentration depending on the security level.

4 Confirmation of user information even if there is only 20mm*20mm left

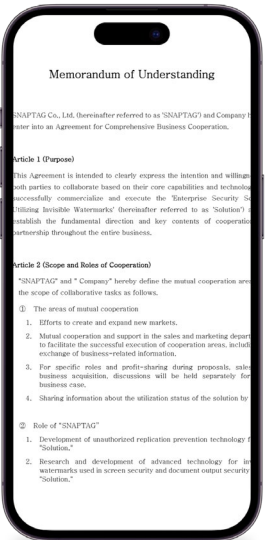
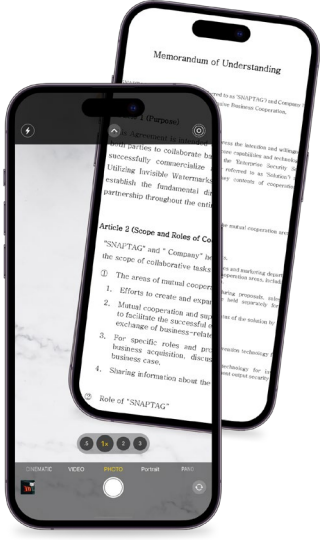

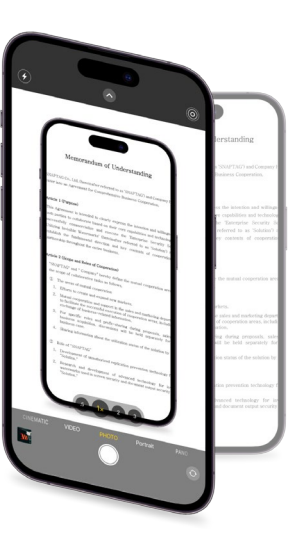
4 It only needs to find one code, so it can confirm the user information if there is only a minimum area left.

5 Raising of user awareness

5 It can raise the user's awareness of leakage by the fact that the invisible watermark is applied at any time. It is also possible to warn of leaks with the phrase, "under surveillance."

3-2. Solution | LAB Guard-M : Mobile app security strong against filming (SDK installation type)

LAB Guard-M covers the entire screen and retains enough of its code to enable user information verification, allowing it to trace leaked images captured through various methods.

<h4>Regular Capture</h4> <p>Can trace leaked images captured by the camera.</p>	<h4>Partial Capture</h4> <p>Can trace leaked images where only a portion of the screen is captured.</p>	<h4>Zoomed-In Capture</h4> <p>Can trace leaked images captured after zooming in on the screen.</p>	<h4>Side-Angle Capture</h4> <p>Can trace leaked images captured from non-standard angles.</p>	<h4>Verification of Leaker's Information</h4>
				<p>Technical Verification Completed</p> <p>ID snap_user1@snaptag.co.kr</p> <p>Name User1</p> <p>Employee number 00001</p> <p>PC SNAP_PC00001</p> <p>IP Address 170.30.1.1</p>

3-2. Solution | LAB Guard-M : Leakage Tracking in various environments

Leakage is unpredictable in terms of timing and methods. LAB Guard-M, with just one piece of code detected in various potential leak scenarios, can trace the leaker with an 8-90% success rate.

Leakage of Nth Shot Images

Verification of Leaker's Information Possible for Nth Capture Images, where the screen is photographed with a camera and the same image is captured again in an Nth shot.

Compression Leakage of Images

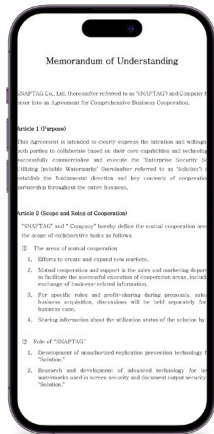
Even with compressed or reduced-quality images due to size constraints, leaker's information can be identified.

External Spread Image Leakage

Sent Images to Other Servers (Messengers, Social Media, Communities, etc.) Leaker's information identifiable.

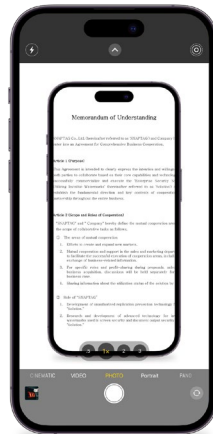
App Screen

App Screen with Applied Solution



1st Capture

Capturing App Screen with Camera

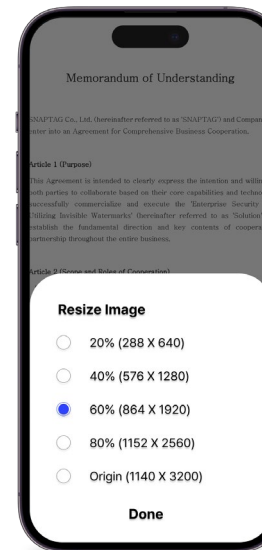


2nd Capture

Capturing the Captured Image Again



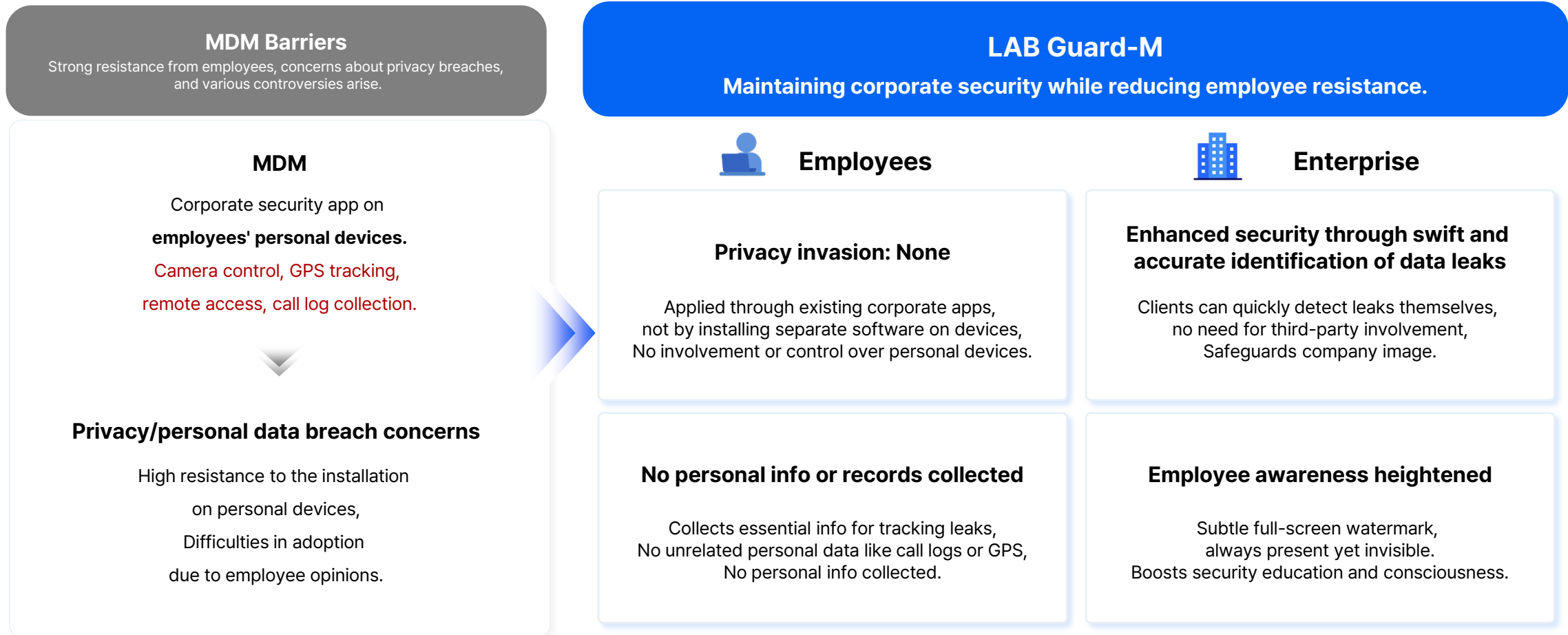
Nth Capture



3-2. Solution | LAB Guard-M : Security Solution for both companies and workers

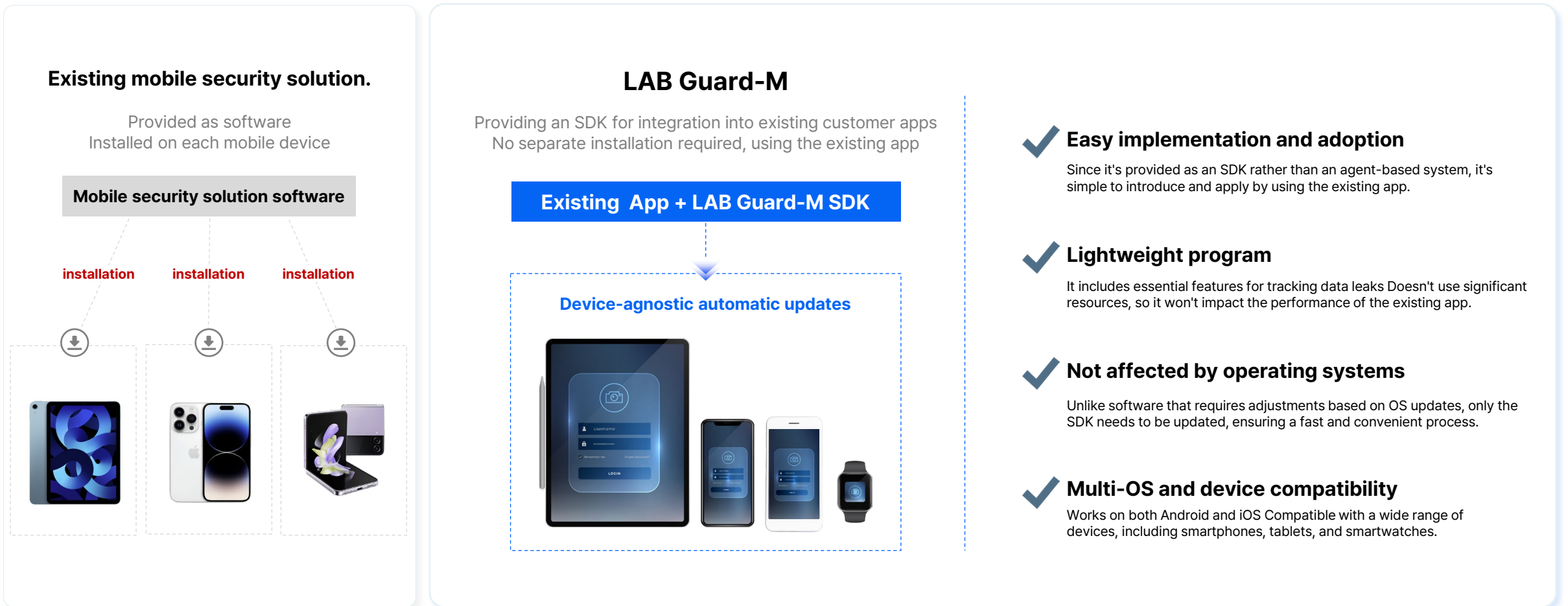
Rising smartphone data leaks prompt businesses to bolster mobile security. Yet, clashes arise over controlling personal devices.

SNAPTAG offers 'LAB Guard-M', the invisible watermark security solution satisfying both enterprises and workers.



3-2. Solution | LAB Guard-M : Applicable to all mobile devices without the need for separate app installation

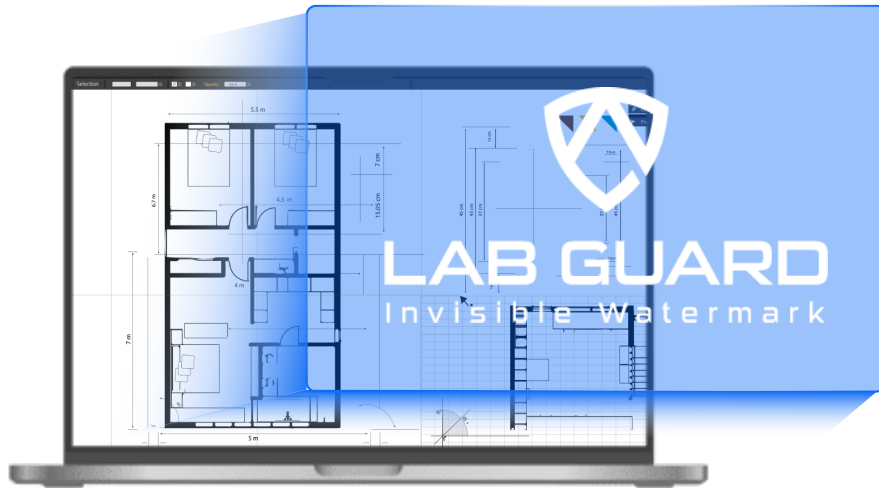
LAB Guard-M works on all mobile devices without needing an app. It's for smartphones, tablets, smartwatches, and provides an easy SDK to add to existing apps, making it convenient for businesses.



3-2. Solution | LAB Guard-S : PC Screen Security (Server-Client construction model)

The PC screen security solution allows the confirmation of leaked information if it is leaked to shooting and screenshot by executing LAB Guard on the PC screen.

Top application in layer method to the entire screen



LAB Guard is layered at the top of the screen. It is independent of any program, so LAB Guard can work in any environment. On the contrary, it can also only work in a specific program, so you can control the operation LAB Guard according to the policy.

* The update time of the invisible watermark can be set according to the policy

Possible to adjust the security strength by controlling the watermark concentration by situation

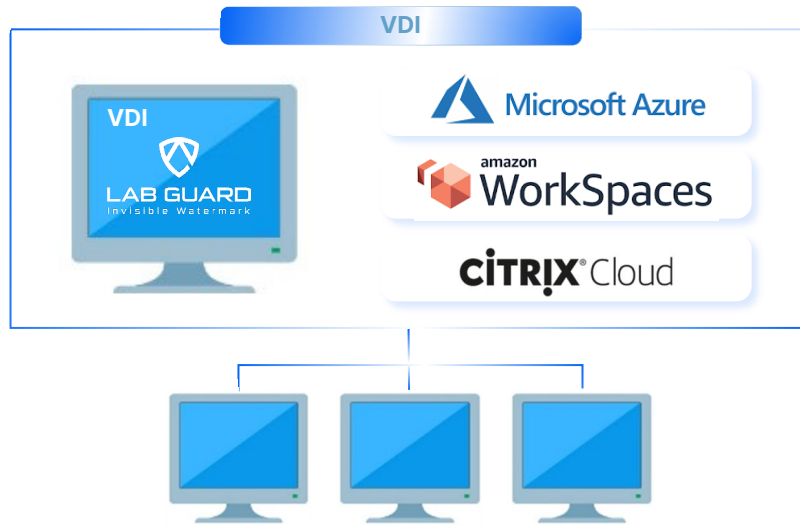


The ones with high security ratings can be tracked quickly in case of leaks by deepening the concentration of the invisible watermark. Also, it is possible to adjust the concentration according to the department and position, so the security strength can be adjusted. It can enhance the security by deepening the concentration of the invisible watermark even in the case of out-of-company environments (telecommuting) and collaboration.

3-2. Solution | LAB Guard-S : VDI Screen Security (Server-Client construction model)

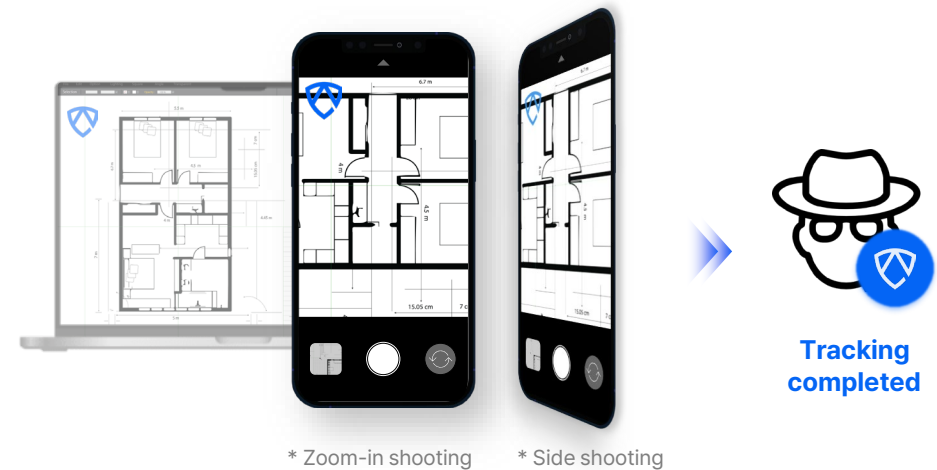
The PC screen security solution can run LAB Guard on the PC screen to check the leaked information if it is leaked to the shooting and screenshot.

Also applicable to the VDI environment



LAB Guard works the same in the **VDI environment**. When logged in, LAB Guard runs automatically, and LAB Guard is applied to track the leaked information after leaks from screenshot and camera shooting on regular PC. Currently, we have completed the tests in the environments such as **MS Azure, Amazon Workspace, and Citrix**, and you can run LAB Guard in each VDI environment.

Also trackable in the case of camera shooting leaks

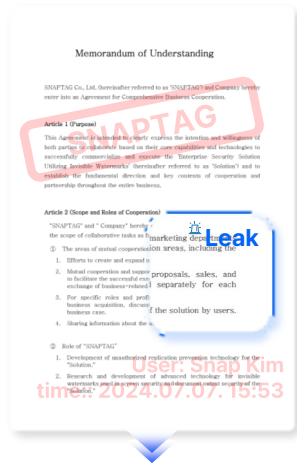


There are frequent accidents that occur when the PC screen is taken by the cell phone. On the other hand, the LAB Guard solution can also track the **shooting of lateral and magnified images**. If only one invisible watermark code is found, the relevant information can be obtained.

3-2. Solution | LAB Guard-P : Printout Security (Server-Client construction model)

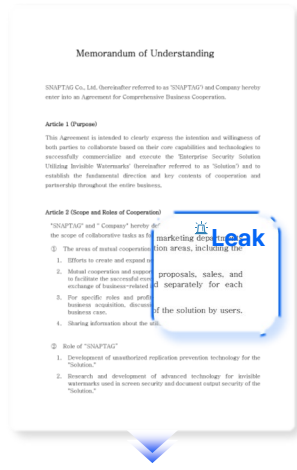
When printing, because it is printed by applying LAB Guard to the entire document, information such as user ID, password, and printout time can be identified regardless of any leaked parts. We have completed the printer driver test, and it is possible for customized solution depending on the type of the driver.

General Watermark



Untraceable

LAB Guard Solution



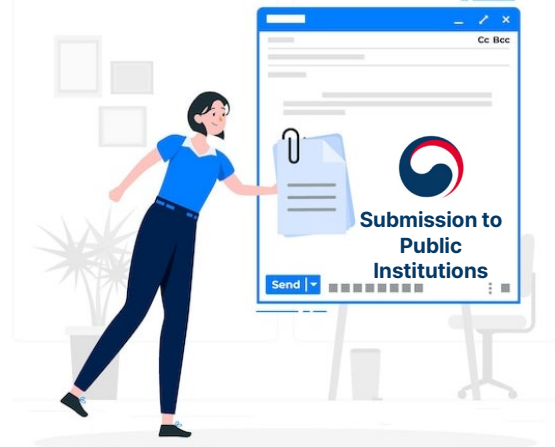
Trackable

LAB Guard Security Without Blind Spot



Documents with normal watermarks are likely to leak through the blank spaces between watermarks. On the other hand, **LAB Guard solution can track whatever part the user leaks.**

No Need to Delete Watermark When Submitting to Public Institutions



LAB Guard's document security makes information such as ID and password invisible. You can grasp the information only with a dedicated verification module, and you do not have to set up the watermark.

* Applicable documents: PDF, PNG, JPG etc.
* Update to the 1-minute unit of the invisible watermark

3-2. Solution | LAB Guard-P : Printout Security (Server-Client construction model)

At the time of printing, LAB Guard is applied to the entire document, so it is possible to identify information such as user ID, password, and printout time of any leaks. The printer driver test has been completed, and customized solution can be done according to the type of driver.



Trackable by the minimum area of 20mm*20mm

Tracking is possible if there is only a minimum area left. With an area of only about 2cm, there is a great advantage of identifying leaked information through the verification module.

Enhancement of security by deepening the concentration of the invisible watermark in important documents

Security can be enhanced by increasing the concentration of the invisible watermark on documents that have a large impact when leaked, such as quotations, confidential documents, etc. It can be tracked because the watermark remains even after 6 times of copies.

3-2. Solution | LAB Guard-F : File Watermark (SDK installation type, Dedicated Program provided)

It's a solution where an invisible watermark is automatically applied when images, videos, PDF files, etc. , are saved or transmitted.

Even if such files are captured and leaked, the captured copies retain the invisible watermark, allowing the leaker to be traced.

It can be integrated with existing work systems in the form of an SDK,

or you can use the dedicated program provided by our company, LAB Guard-F, to insert invisible watermarks into images, videos, and PDF files for work purposes.

* We are also preparing to integrate LAB Guard-F with the MS MIP Gateway solution, enabling the insertion of invisible watermarks into images, videos, and PDF files when using MS AIP.



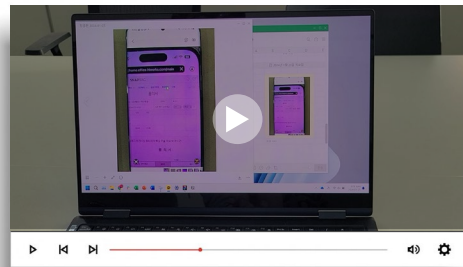
Image

Design drafts, advertising materials, new product images, scanned documents, etc.



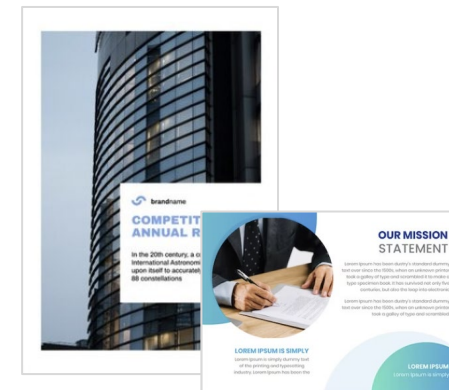
Video

Promotional videos, demo videos, test videos, 3D modeling, etc.



PDF

Reports, presentation materials, contracts, legal documents, etc.

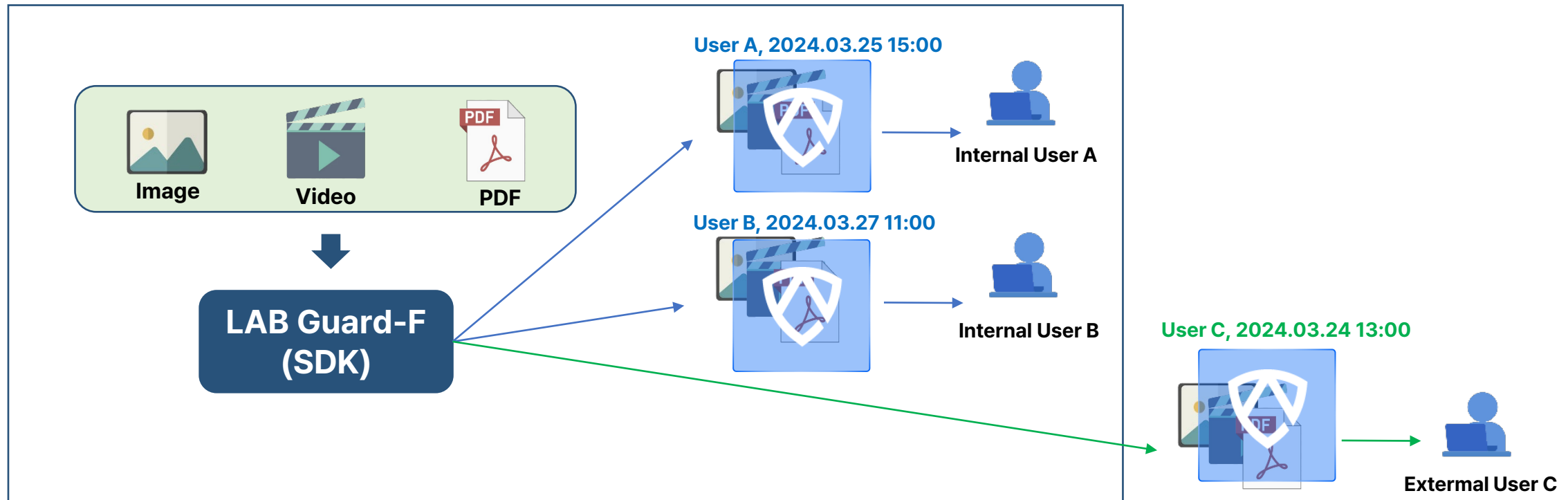


3-2. Solution | LAB Guard-F : File Watermark (SDK installation type)

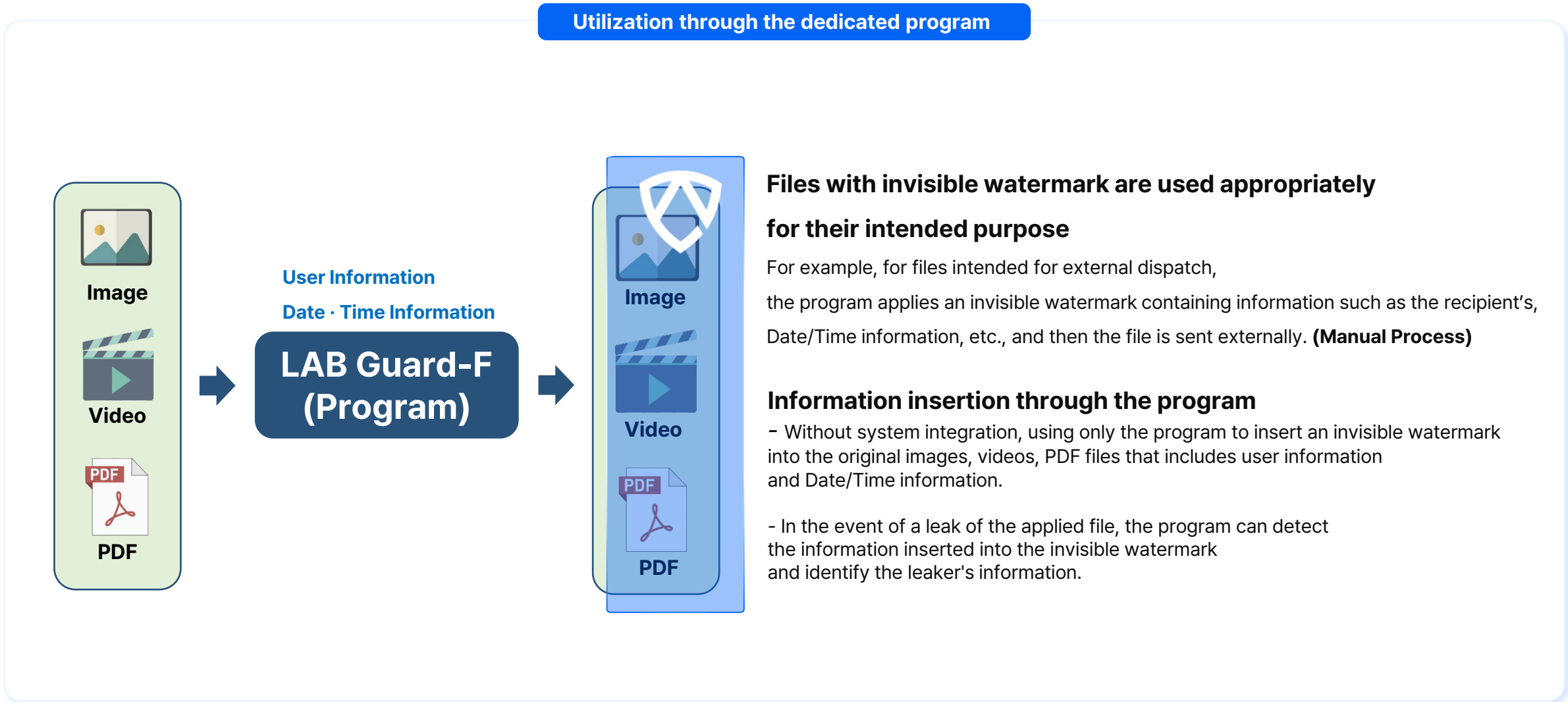
Integration of SDK into the internal work

Integrated directly into the process of the internal work system, invisible watermarks are automatically applied. For example, integration into the process for files intended for external dispatch, so that invisible watermarks containing the recipient's information are applied. **(Automatic process)**

Client's internal work system



3-2. Solution | LAB Guard-F : File Watermark (Dedicated program provided)



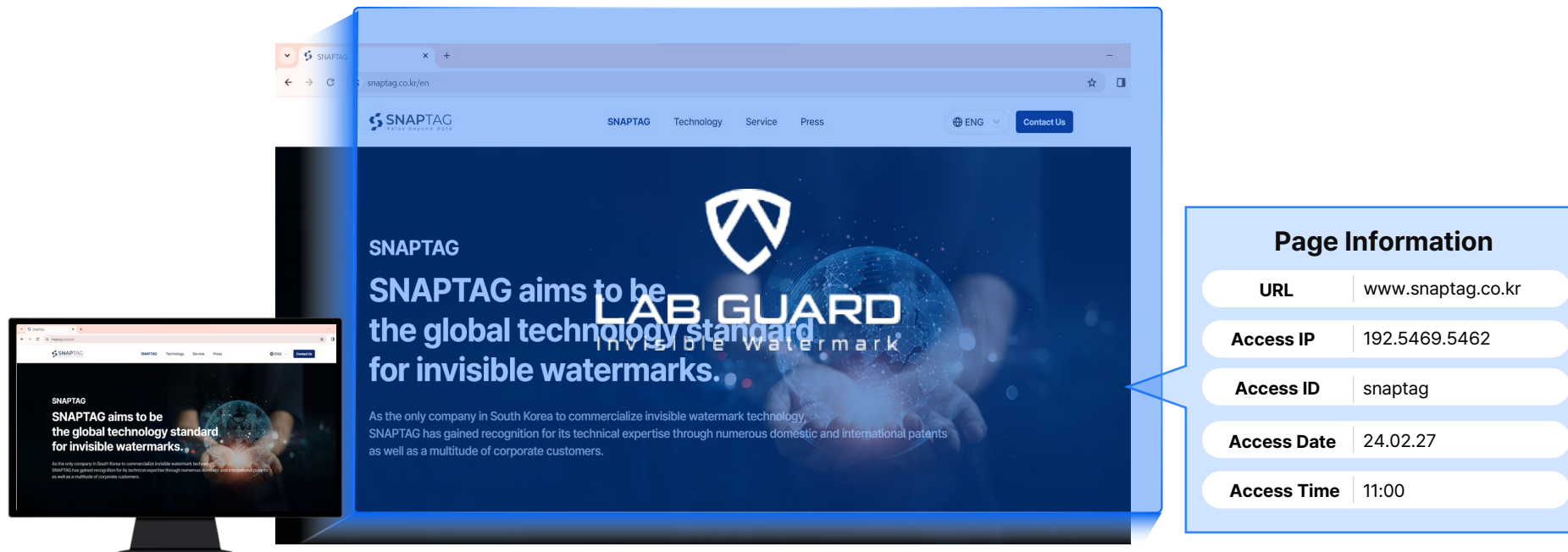
3-2. Solution | LAB Guard-W : Web Screen Security (SDK installation type)

The invisible watermark is a solution that integrates with web-based groupware, apps, pages, etc.

Once integrated, an invisible watermark is always inserted at the top of the web screen, preventing information leakage within the web page.

- The density of the invisible watermark can be adjusted to set various policies appropriate for the situation.
- The existing Web development source can easily integrate and adopt this by installing the SDK (library).

* We are preparing a solution where LAB Guard-W is integrated with the MS Teams groupware solution, applying an invisible watermark to the screen when using Teams groupware.

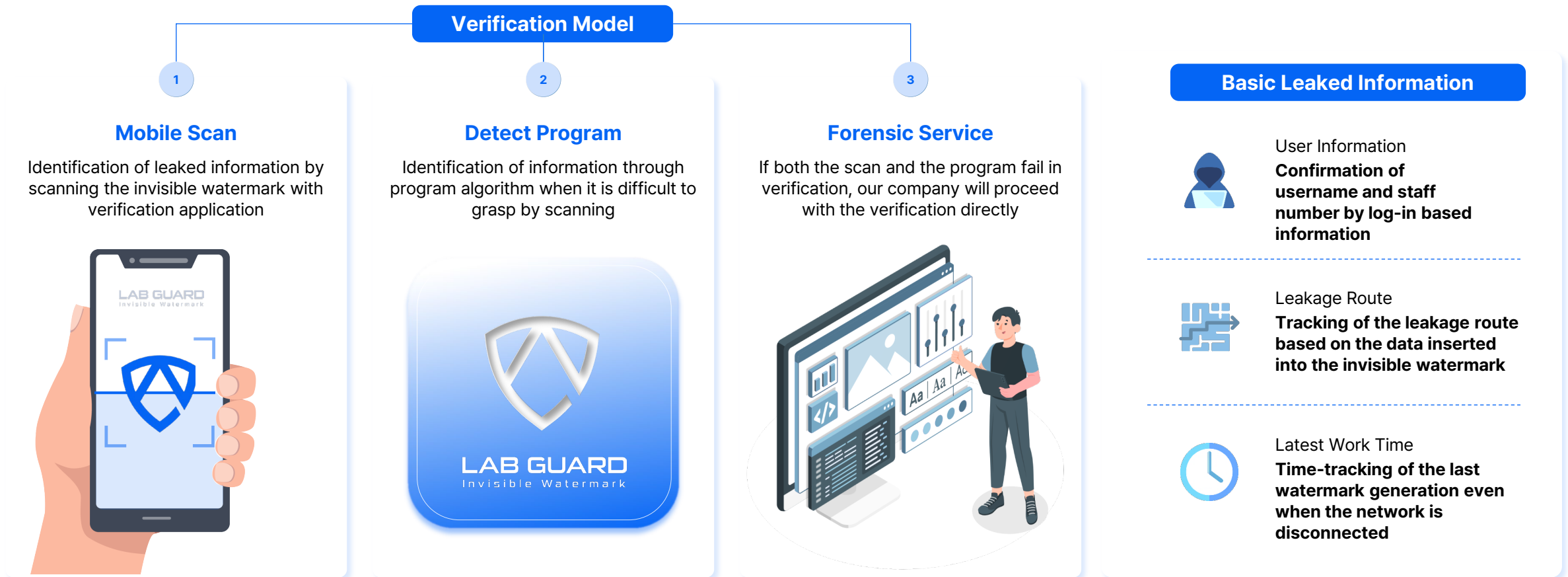


Page Information	
URL	www.snaptag.co.kr
Access IP	192.5469.5462
Access ID	snaptag
Access Date	24.02.27
Access Time	11:00

3-3. Verification Model

There are scan/program/forensics approaches to the verification model that can read LAB Guard's codes.

The verification model is only **available to the administrator** and cannot be scanned to the camera on the regular smartphone, making the data unreadable.



* Separate cost incurred

3-4. Reference

We are currently engaged in contracts and Proof of Concept (PoC) activities with major corporations, collaborating with the leading domestic cybersecurity firm in the country.

Contracted Companies and Cooperation Companies

삼성전자판매 

Screen security: Local, VDI


삼성전자
삼성전자 반도체

Screen security: Local, VDI

 LG 에너지솔루션

Screen security: Local, VDI

 ZAIsoft

Groupware, enterprise document security software specialist company

Wowsoft

Integrated security software-specialized company

KICO
SYSTEMS

Integrated security software specialist company (in Japan)

 킹스정보통신(주)

DLP-specialized company for 25 years

ePapyrus[®]

PDF solution-specialized company (Provision of the invisible watermark on PDF file)

04

Generative AI Image Authentication

- **4-1. Introduction Background**
- **4-2. Introduction to Generative AI Image Authentication**
- **4-3. Coexistence of AI-generated works and copyright works**
- **4-4. Introduction effects**
- **4-5. Reference**

4-1. Introduction Background | Various copyright lawsuits occurring worldwide due to copyright infringement in the generative AI training process

Controversies over copyright infringement in the training process of generative AI are growing, leading to a series of lawsuits against generative AI companies.

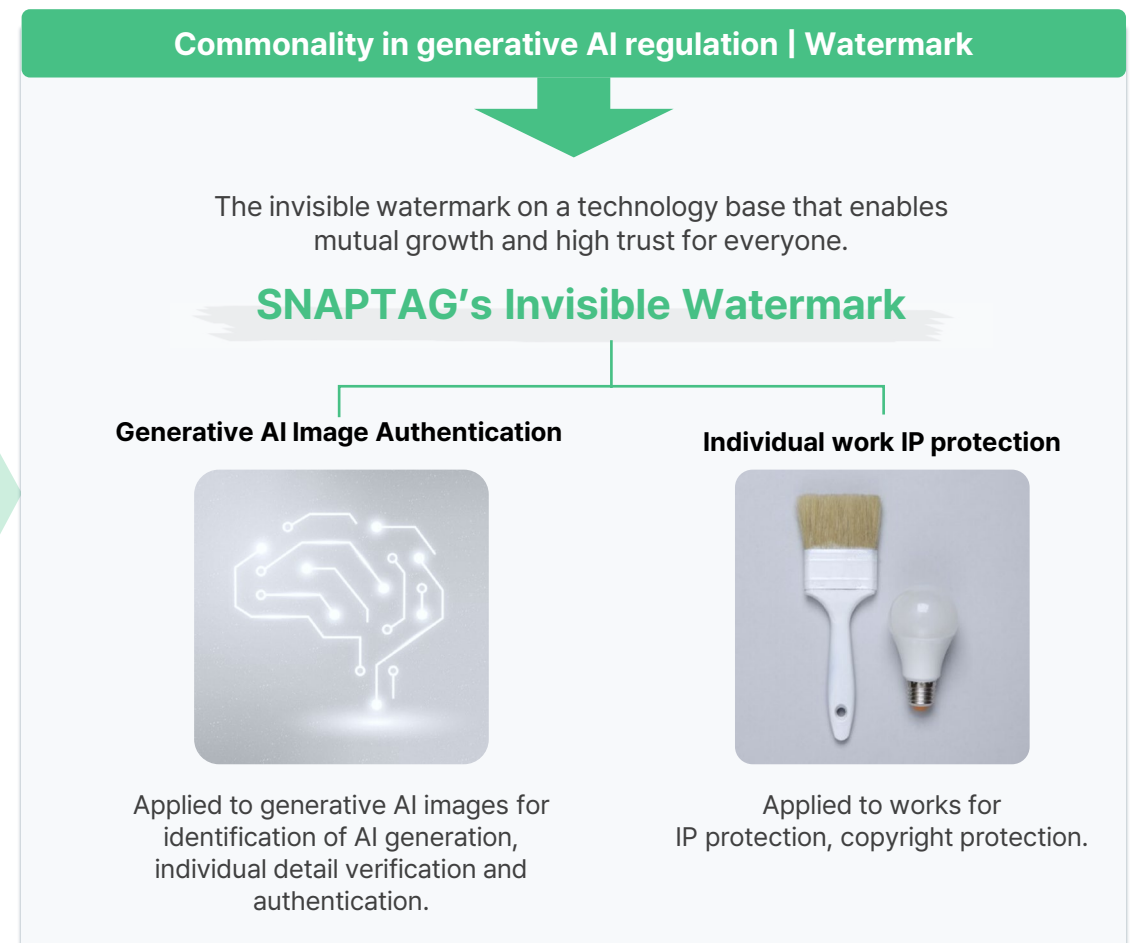
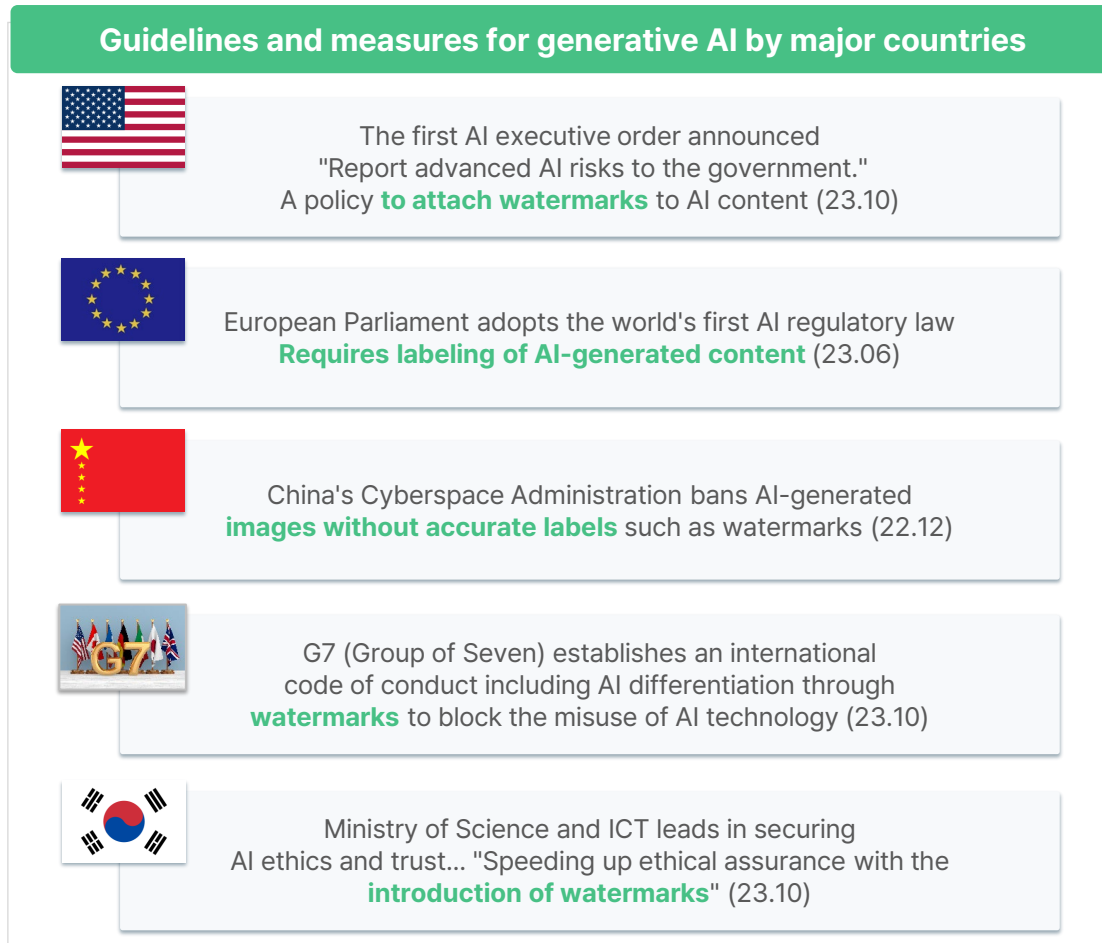
Lawsuits related to generative AI companies

Getty Images: The largest image provider in the U.S.		Painters such as Sara Anderson and two others		Coders using GitHub Copilot, the AI code generator	
Target	Stability AI (image generation AI developer)	Target	Stability AI, Midjourney AI Research Institute	Target	GitHub Copilot (Microsoft)
Time	January 2023	Time	January 2023	Time	November
Reason	Illegally used millions of images for AI image generation without a Getty Images license, infringing on copyrights.	Reason	Without the consent of the creators, their works were used without authorization for the training of generative AI.	Reason	Illegally duplicated billions of lines of open-source code created and shared by millions of programmers on GitHub to generate code.

source: Chosun Ilbo

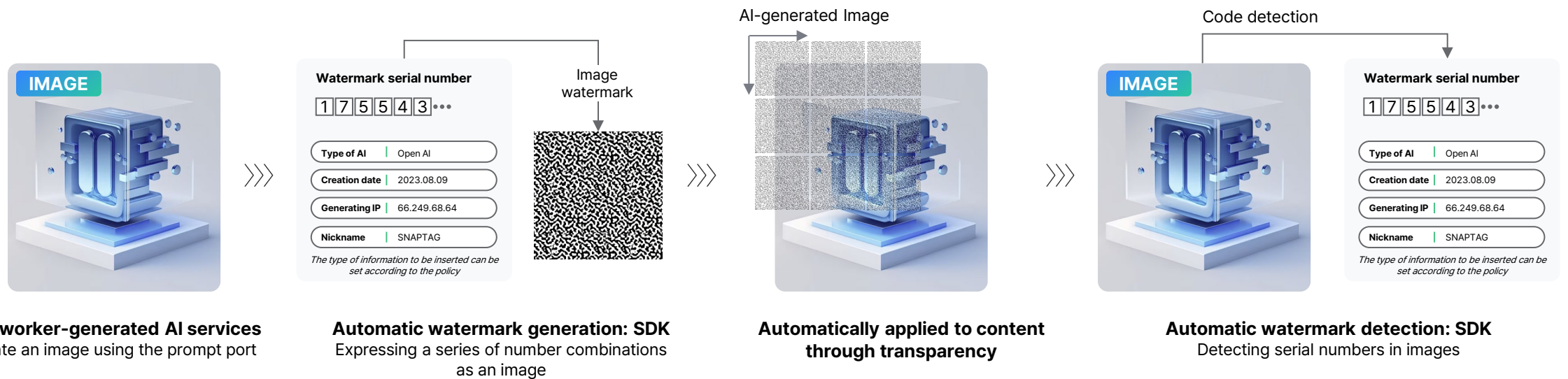
4-1. Introduction Background | The intensification of various countries' movements for the proper use of generative AI

For the proper utilization of generative AI content, countries around the world are implementing legal regulations and guidelines related to this, commonly specifying the inclusion of a 'watermark.'



4-2. Introduction to Generative AI Image Authentication

- When creating images/videos using generative AI services, it automatically encrypts identification information and inserts the invisible watermark into the image upon creation.
- It is the first domestic solution capable of being applied to videos beyond images, with an algorithm optimized for identification in second and third uploads (compression, filters, etc.) without compromising the original aesthetics."



01

Serial number via SDK
converting (58 bits: nearly 28 quintillion combinations) into a watermark image
(Create the watermark)

02

Using the verification module (SDK) to read watermark images
→ **Extracting the watermark serial number**

03

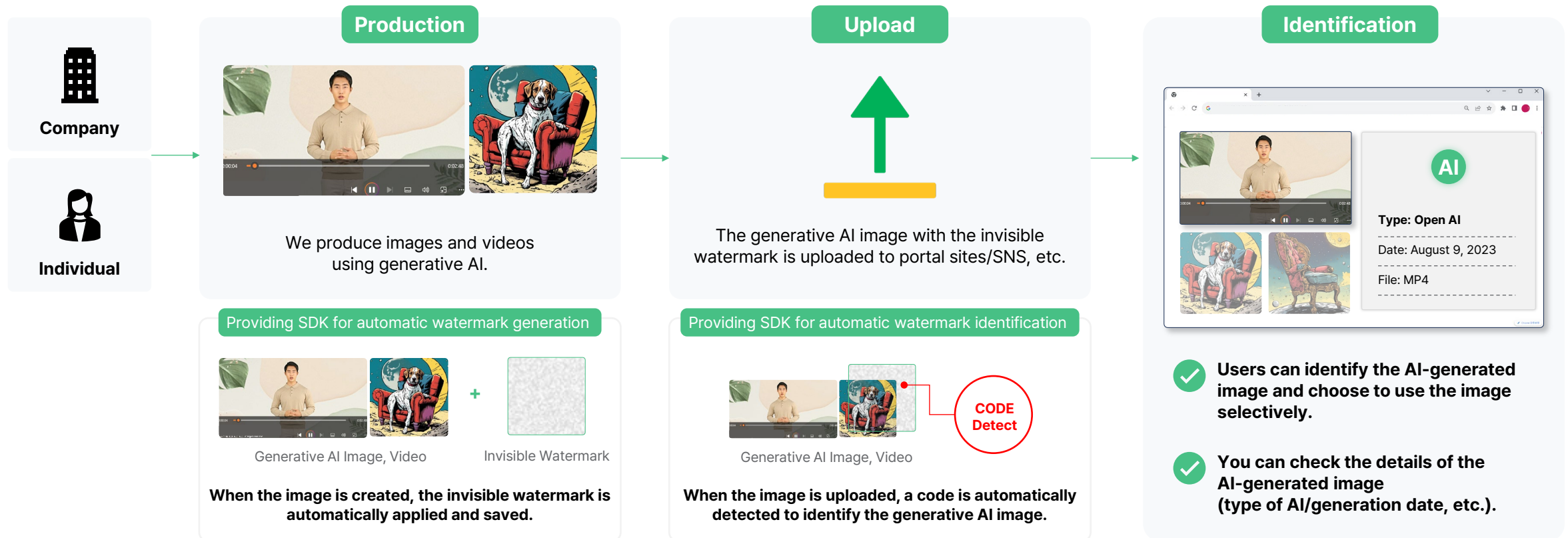
Automatically applying the generated invisible watermark to image

04

Identifying AI image through the information of the extracted serial number

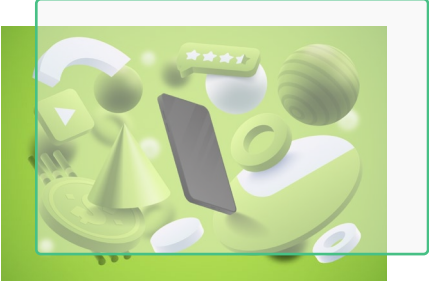
4-2. Introduction Generative AI Image Authentication | Process of applying the invisible watermark within generative AI images

SNAPTAG's invisible watermark is automatically applied over the entire image (or video) when generative AI creates it. When a generative AI image (or video) with the invisible watermark is uploaded to portal sites/SNS, etc., the code can be detected, identifying it as a generative AI image.



4-3. Coexistence of AI-generated works and copyright works | Maximize 2nd to 3rd copyright and utilization through image DB of Generative AI images and IP content

The invisible watermark can be applied not only to AI images but also to general IP content, and the watermark can be read from both AI images and general IP content through the watermark identification module. When the invisible watermark are applied to general IP content, it enables copyright authentication and, during AI training, functions like a log feature for usage fee settlement, allowing for diversification of business models.




Watermark extraction

- Only possible through designated algorithms
- The watermark is secured
→ prevents tampering
- 100% reliable
- Immediate verification

Detecting
≤ 1.0
seconds

Image identification

Original



AI Generated


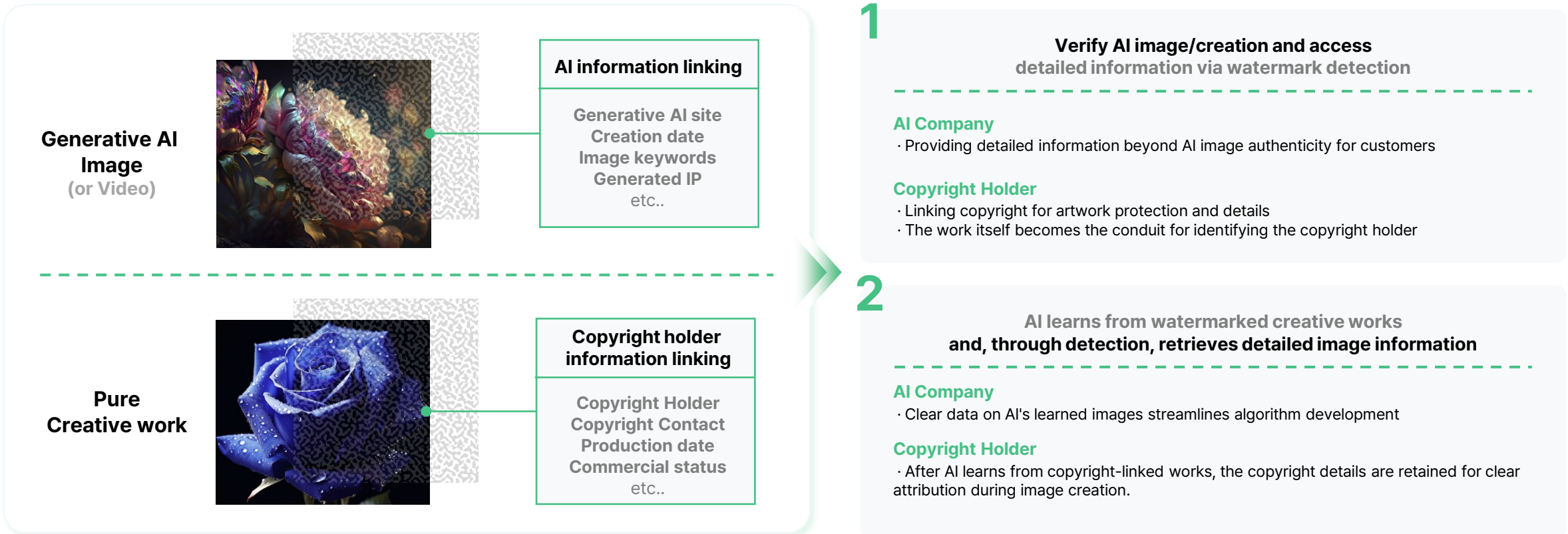


Image database user activity log

Prod	DateTime	User	Duration	Title	Executable	URL
🟢	12/18/20 09:21:02	Michael Watson	8s	New Message (1) - Google Ch...	Google Chrome	http://ghpfgfpehs.eymwico...
🟢	12/18/20 09:21:10	Marcy Engelman	Passive - Locked		System Event	
🟢	12/18/20 09:21:14	Tamika Sprow	23s	New Tab - Google Chrome	Google Chrome	http://tgyfwu.dhyzznh.ru
🟢	12/18/20 09:21:38	Victoria Shields	Sleep		System Event	
🟢	12/18/20 09:21:41	Javier Abellera	36s	https://www.youtube.com/watc...	Google Chrome	http://dhepraru.sflugkwtuqh...
🟢	12/18/20 09:21:48	Hank Stakem	Passive - Locked		System Event	
🟢	12/18/20 09:21:55	Daron Duht	Passive		System Event	
🟢	12/18/20 09:22:01	Maximo Fuell	12s	New Message (1) - Google Ch...	Google Chrome	http://fhrvjf/bepkptll.bg
🟢	12/18/20 09:22:08	William Lansford	55s	https://www.macdownloads.co...	Safari	http://easdmwltz.jhgyy.ie
🟢	12/18/20 09:22:12	Farah Gandhi			System Event	
🟢	12/18/20 09:23:18	Kenya Sandover	36s	https://www.instagram.com/an...	Google Chrome	http://fbwaj.hqrntorz.info
🟢	12/18/20 09:24:36	Freeman Capes	Resume		System Event	
🟢	12/18/20 09:24:51	August Conyers	39s	https://www.777coins.com	Safari	http://fzsdnullfo.glegvdx
🟢	12/18/20 09:30:48	Harland Slera	8s	New Message (1) - Google Ch...	Google Chrome	http://boeevew.igkdxtrzr.info
🟢	12/18/20 09:30:51	William Cook	Resume		System Event	
🟢	12/18/20 09:32:00	Veronica Pucket	2s	https://www.youtube.com/watc...	Google Chrome	http://ubvts.lkgpsetsh
🟢	12/18/20 09:33:04	Cleo Pavellch	13s	System Event	Google Chrome	http://lptzo.ayamcl

4-3. Coexistence of AI-generated works and copyright works

The invisible watermark can be applied **not only to AI images but also to general IP content**, and **watermark identification modules enable the reading of the watermark in both AI images and general IP content**. The application of the invisible watermark to general IP content allows for copyright authentication and usage fee settlement through log functions during AI training, enabling diversification of business models.



4-4. Introduction effects

Features

- ✓ It is invisible, so you can enjoy the image as it is **without harming the aesthetics of the image.**
- ✓ The invisible watermark are applied to the entire image, **making it impossible to remove the watermark unless the image itself is damaged.**
- ✓ In the case of videos, **it is possible to gather information from just a portion of the timeline.**

Effect of Introduction



Safety

Using the watermark to prevent AI side effects and protect copyright of creative works.



Produce

AI creators can freely create in a safe environment

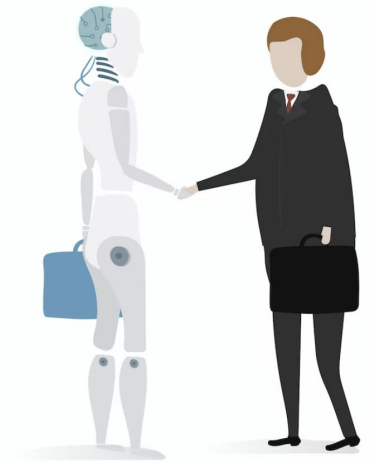


Coexistence

A creative world where AI technology and pure creative works coexist

Coexistence of Safe AI and Humans

Ethical technological innovation is possible as responsible and reliable AI can be utilized through protective devices



4-5. Reference

Currently, it is confirmed to be applied at Kakaobrain, a domestic generative AI company, and we are collaborating with a generative AI startup association

AI Watermark Reference Contract completed	AI Watermark Reference Contract completed	AI Watermark Reference Membership of an association	AI Watermark Reference Membership of an association
 <hr/> <p>For generative AI content Apply watermark</p>	 <hr/> <p>For generative AI content Apply watermark</p>	 <hr/> <p>Generative AI Startup Association. Membership, networking for various companies</p>	 <hr/> <p>Korea Information Security Industry Association. Membership, networking for various companies</p>



IP Authentication

- **5-1. Authentication Method**
- **5-2. IP Authentication Overview**
- **5-3. Distribution**
- **5-4. Sports**
- **5-5. Entertainment**
- **5-6. Art**
- **5-7. Expected Effects**
- **5-8. Reference**

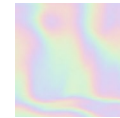
5-1. Authentication Method



Invisible watermark



QR code



Hologram



NFC



RFID

Authentication method	Authentication via mobile APP	Camera APP	Check the actual item	NFC reader function on mobile phone	Dedicated RFID reader
Authentication entity	Simple authentication	Simple authentication	Consumers must personally check the actual product	Simple authentication	Consumer authentication not possible
Security	Not visible to the naked eye Impossible to replicate or forge	Visible to the naked eye Easy to replicate and forge	Can be forged if an identical plate is made	Easy to duplicate NFC chips and cards	Security is excellent, but an average error of 3% occurs
Scalability	Each product can be authenticated Using individual data/ Accurate distribution tracking / Inventory and Returns management / Building a CRM channel	No scalability	No scalability	Easy Product authentication, Distribution tracking, Inventory and Returns management	No scalability

5-2. IP Authentication Overview

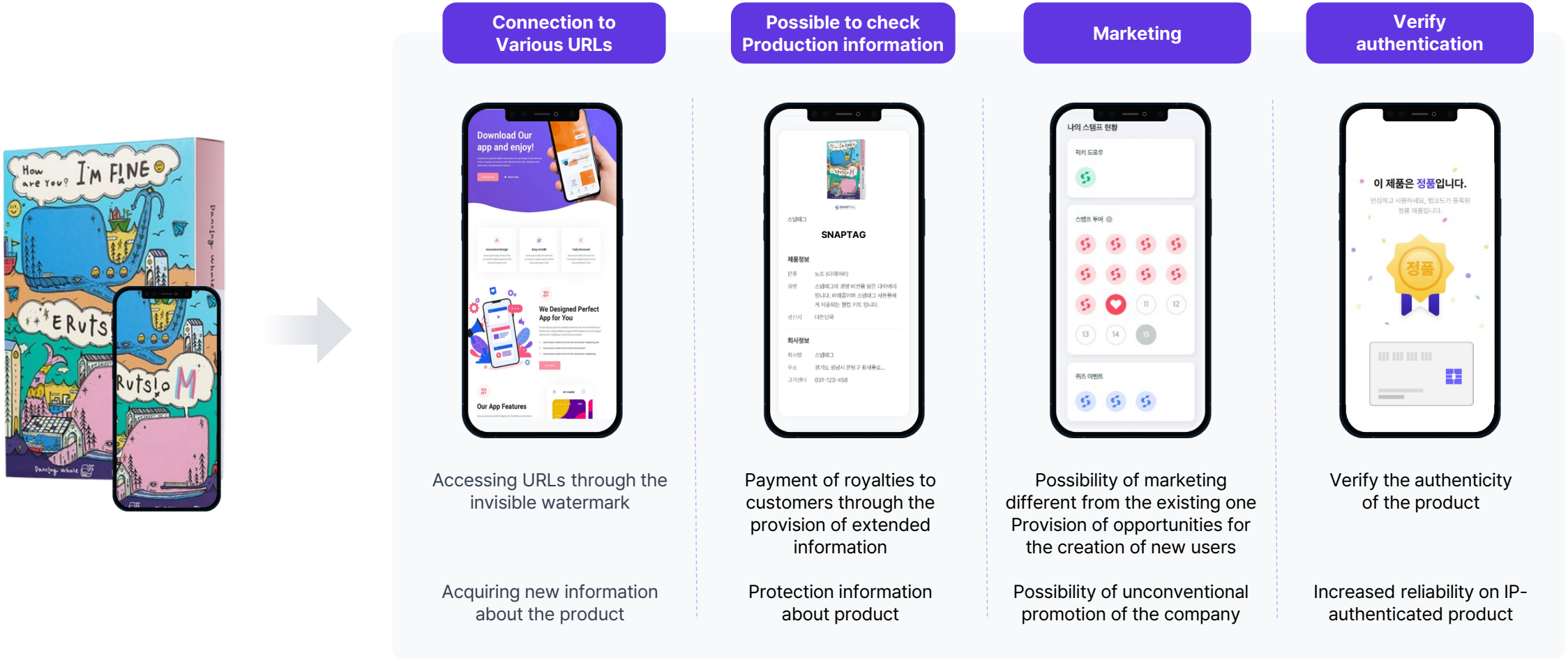
The invisible watermark allows to check a variety of information in the scanned product without harming content design.

As a result of these features, the invisible watermark is in the spotlight in IP fields such as distribution, sports, entertainment and art.



5-2. IP Authentication Overview

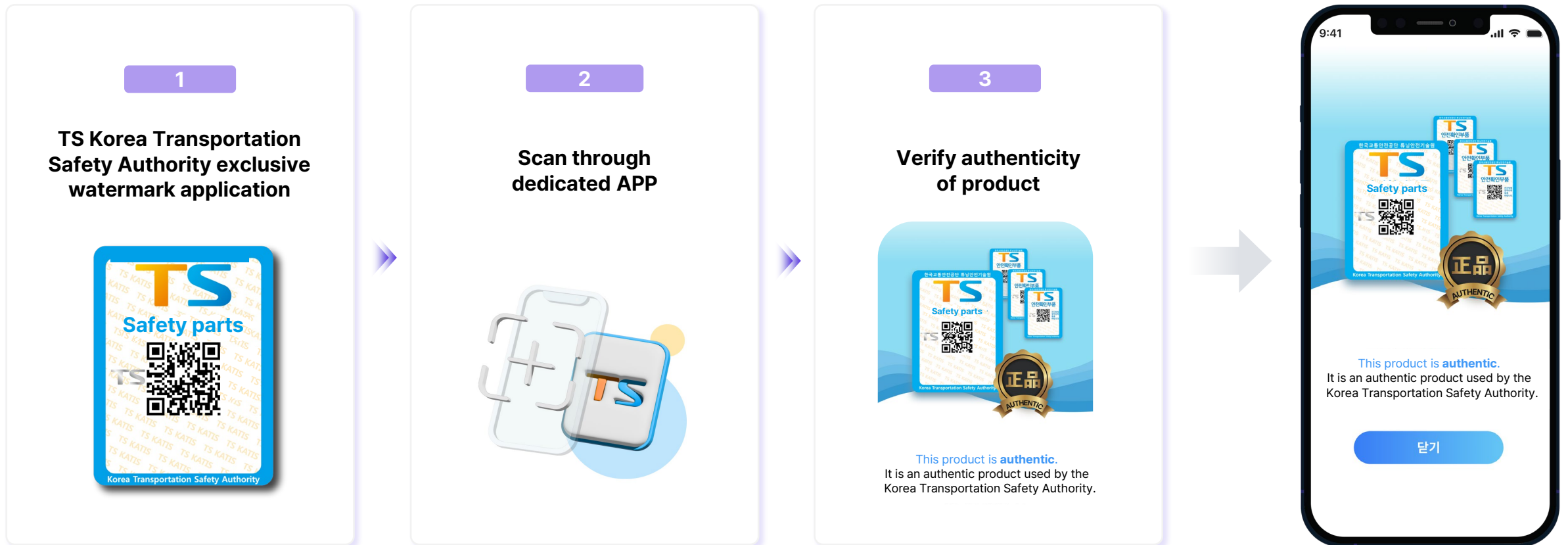
Depending on the customer's needs, you can freely configure the landing page after scanning the invisible watermark.



5-3. Distribution | Verify IP authenticity

We apply an invisible watermark to TS Transportation Safety Corporation's products to verify the authenticity of the product labels used by TS.

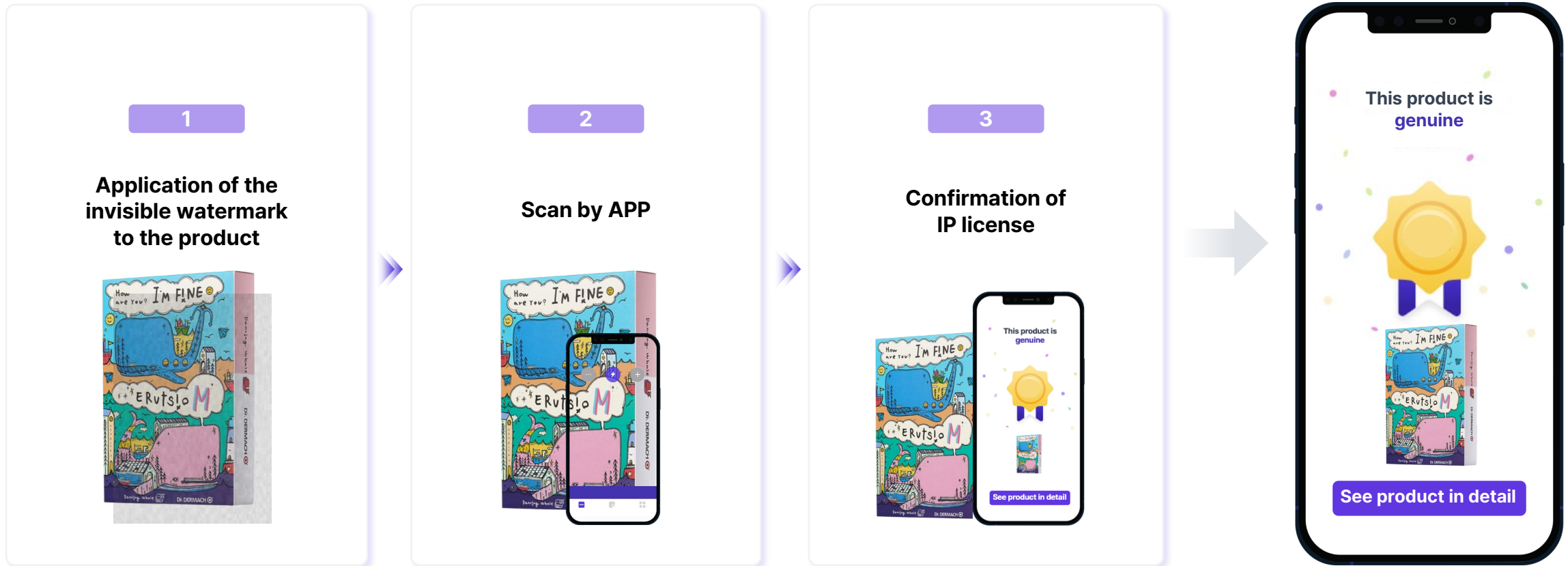
By scanning with the dedicated TS Scan App, it offers high security, and because the watermark is invisible, it provides greater stability compared to QR codes.



5-3. Distribution | Verify IP authenticity

By scanning products with applied the invisible watermark, you can verify IP licenses. This method allows for information insertion without compromising product design and offers high stability compared to QR codes. Even if more than 50% of the product is damaged, a single code discovery enables information verification.

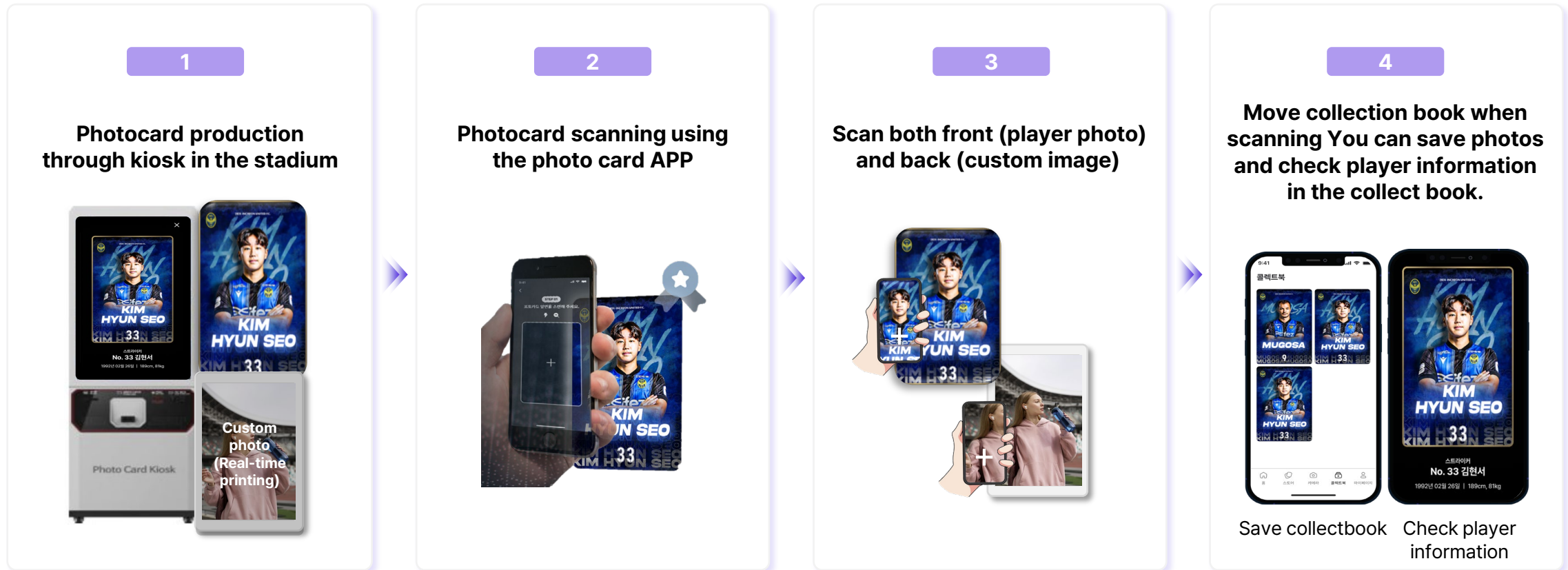
* Example of practical application: Bien Brise mark, Dancing Whale mask pack, etc.



5-4. Sports | Offline IP utilization

Player photocards with invisible watermarks are produced using kiosks located at professional sports teams' offline stadiums.

By scanning these photocards through the photocard platform, users can view player information. Scanning both player images and custom images allows users to access various information through the app, providing an expanded experience that bridges online and offline realms.



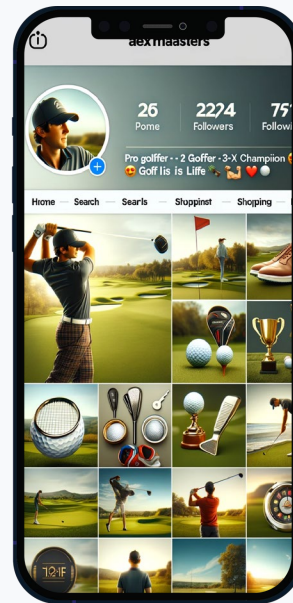
5-4. Sports | IP utilization

By scanning products with applied the invisible watermark, you can access information that is not visible offline in the online space. Scanning allows you to navigate to online areas such as URLs and digital content, providing access to more comprehensive information.

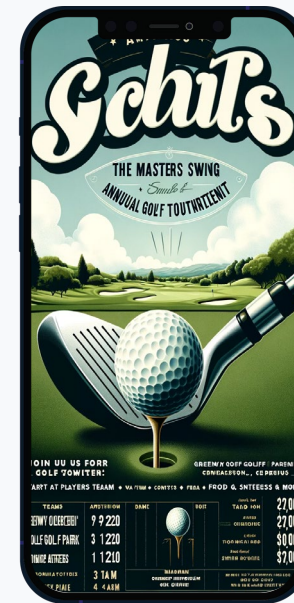
* Example of practical application: KLPGA Members, Foodinko sticker, Jeongeum card, etc.



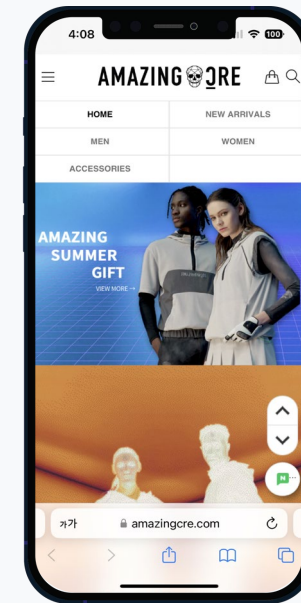
Connection to a variety of URLs



Connection to SNS



Connection to homepage



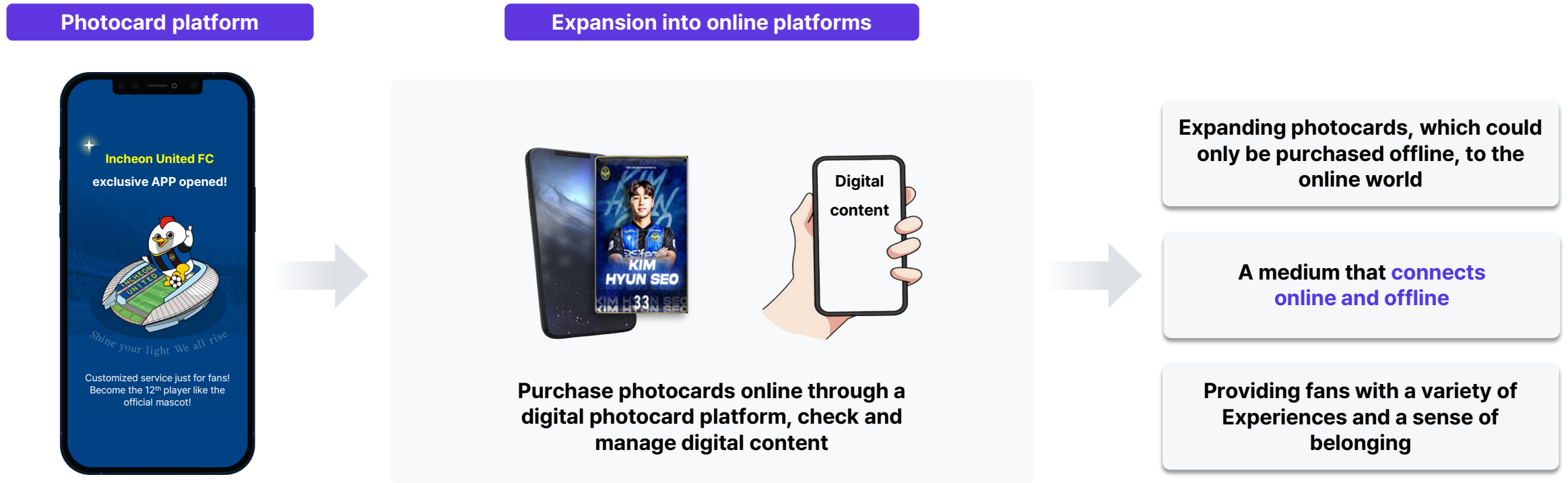
Connection to sponsor



5-4. Sports | Online IP utilization

Expanding from an offline photocard platform to an online digital photocard platform allows users to purchase photocards online and view and manage digital content. This serves as a bridge connecting online and offline experiences, offering fans a diverse range of interactions.

* Example of practical application: Incheon United FC photocard platform

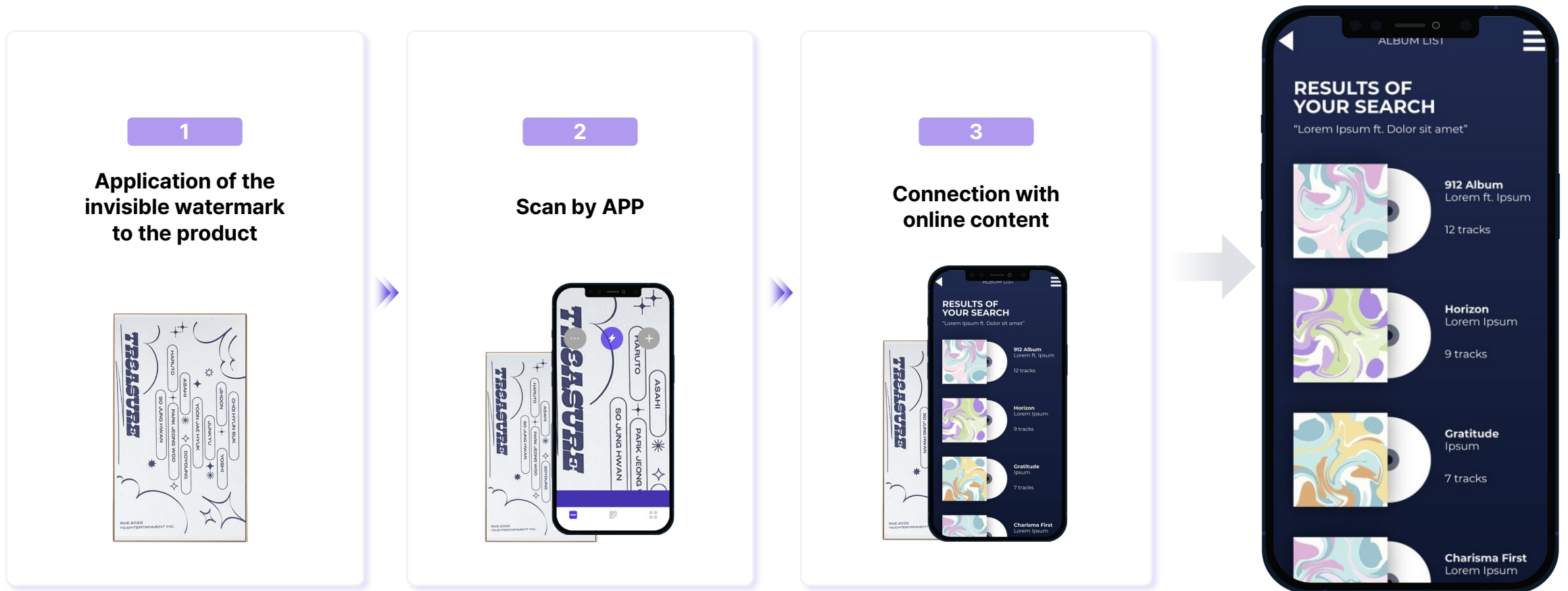


5-5. Entertainment | Digital Goods

With the invisible watermark, you can connect a variety of online content with goods without damaging the design of the image.

When scanned, it moves to the online content related to the image. It is not limited to offline, and you can interact with and enjoy online.

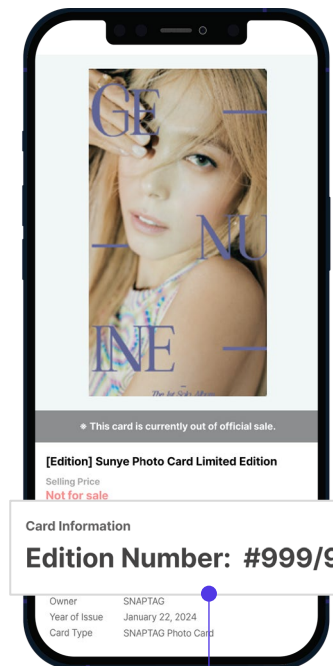
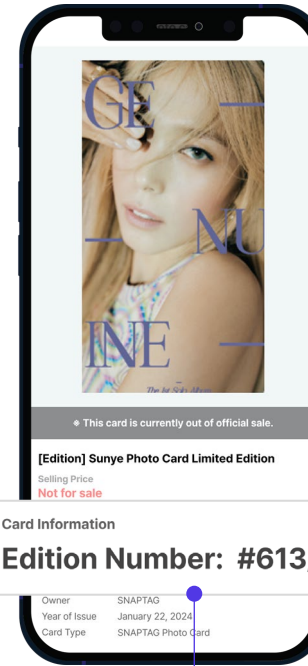
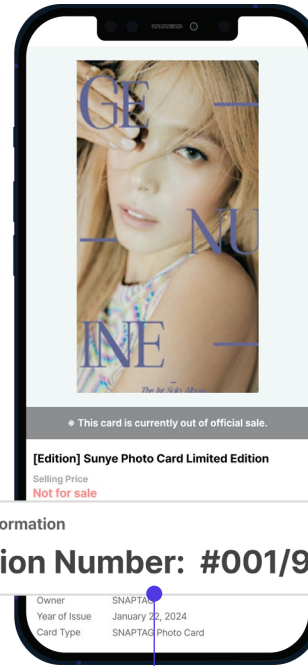
* Example of practical application: Card albums of Nemoz Lab



5-5. Entertainment | Offline NFT

Through the invisible watermark, the aesthetics of the image are maintained while bestowing unique values to each instance of the same product, such as edition numbers, NFT information, hidden content, etc. The invisible watermark provide distinct, individual values to each product, creating additional rarity.

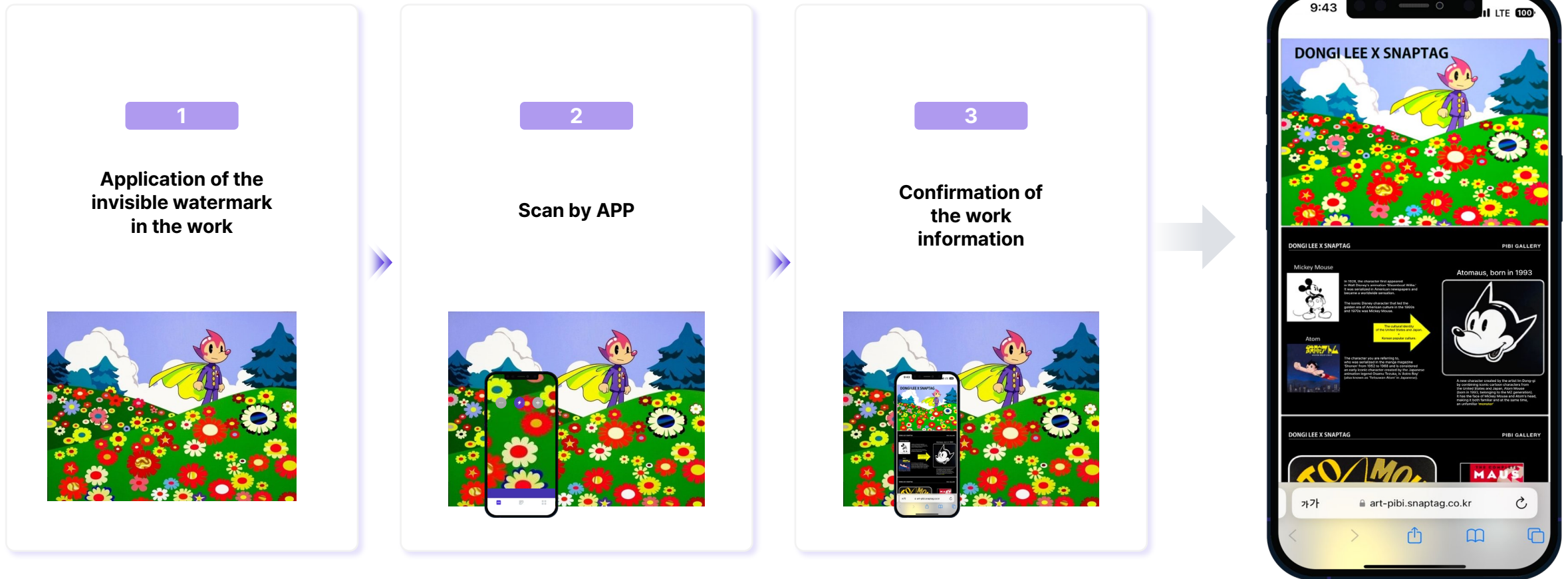
* Example of practical application : Nemoz Lab photo card



5-6. Art | Provision of Work Information

Applying the invisible watermark to artworks allows for scanning to access information related to the artwork. The invisible watermark applied to art pieces are difficult to distinguish with the naked eye. When viewers scan the artwork, they can easily access descriptions, information, and related content about the artwork.

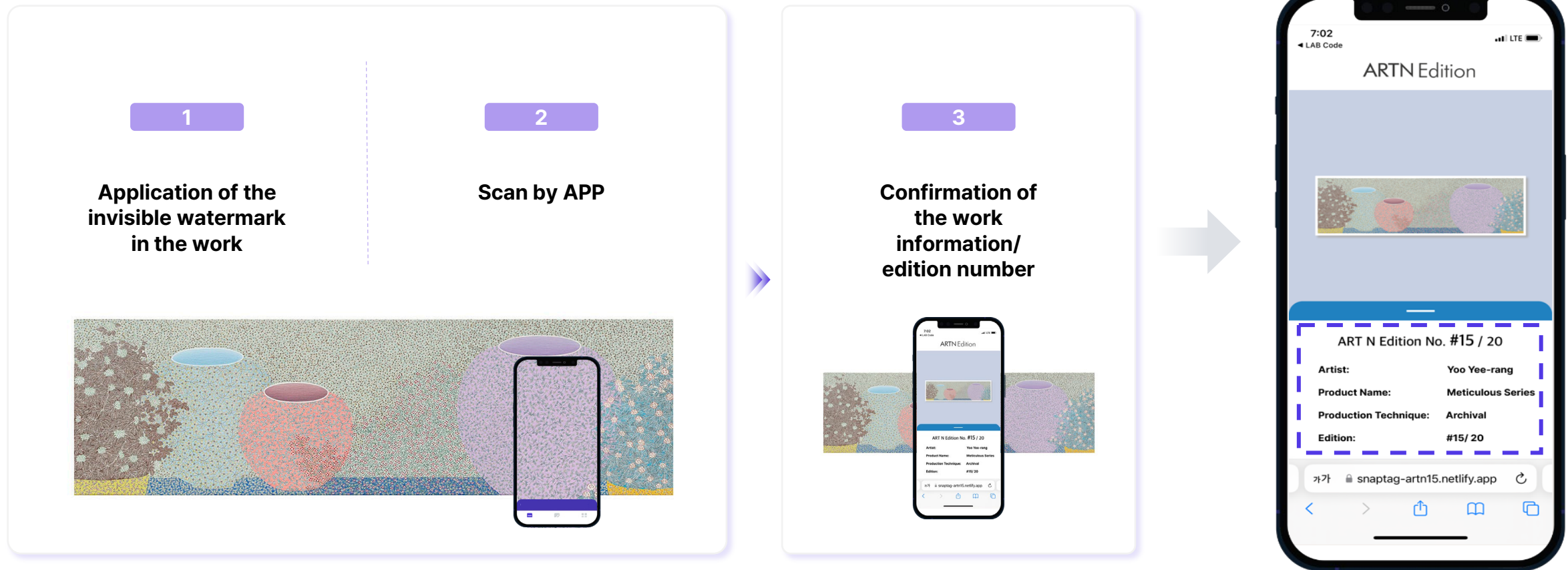
* Example of practical application: ARTN Edition, PIBI GALLERY, and frames in the rooms of NURAT STAY



5-6. Art | Confirmation of Edition Number

With the application of the invisible watermark to the edition printmaking of which the value varies depending on the scarcity, the edition number of the work itself is possible. Scans enable confirmation of the edition number, which further increases the guarantee and scarcity of the work.

* Exhibition of the work at the Seoul Living Design Fair in February 2023



5-7. Expected Effects

The invisible watermark aims to break down the boundaries between online and offline and provide a variety of experiences.

1

Reduce unnecessary costs

With an invisible watermark, both authentication and digital content tracking and management can be achieved, reducing unnecessary costs.

2

Increase sales

Various promotions and content profits through accumulated customer DB lead to the influx of new customers and increased sales.

3

Provision of product differentiation and scarcity

The invisible watermark enable the registration of unique information for each product, providing scarcity value. This can be utilized for various promotional elements such as Limited edition releases.

4

Possibility of various marketing using the invisible watermark

It is possible for various marketing by stimulating consumers' purchasing psychology and establishing marketing strategies.

5

Strengthening of IP authentication, intellectual property rights and security

The invisible watermark allow for easy verification of IP licenses with just one scan. In the future, this technology can be utilized for settlements with AI-generated content providers and image usage.

6

Collection of consumer information through data analysis


With the scanning method using the application, it is possible to induce installation of partner apps and facilitate continuous CRM marketing for product purchasing members after sales.

* In the case of existence of the partner company's application

5-8. Reference

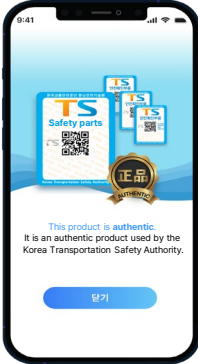
We are collaborating with various industries and utilizing the invisible watermark for diverse product and marketing partnerships.

TS
Korea Transportation Safety Authority




TS genuine label

➤




TS genuine authentication

KLPGA




KLPGA magazine

➤




URL connection to homepage,
sponsor page, etc.

Incheon United
photocard platform



Photocard

➤



Save collectbook and
check information



Digital Check-In

- **6-1. Digital Check-In Introduction**
- **6-2. Introduction of Main Functions**
- **6-3. Implementation Effects**
- **6-4. Usage Reference**

6-1. Digital Check-In Introduction

SNAPTAG offers a quick and convenient digital check-in feature, utilizing the invisible watermark, to enhance the enjoyment and convenience of events for users. The digital check-in feature is provided in the form of an SDK, allowing for easy integration into existing client apps.



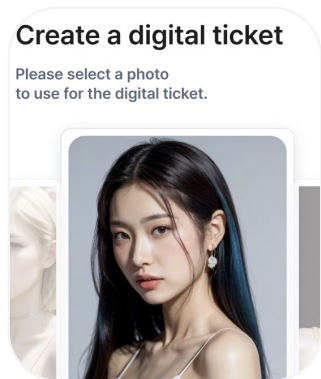
6-2. Introduction of Main Functions

It provides the functions for the convenience of both users and clients.

Utilization at Check-ins and Events

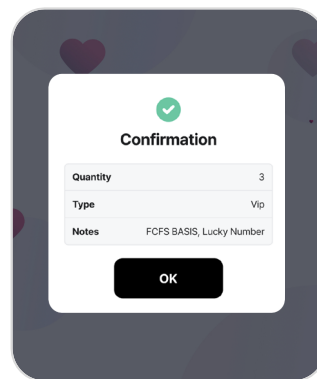
Digital check-in app

Digital utilization within offline events, progress of more pleasant and smart events



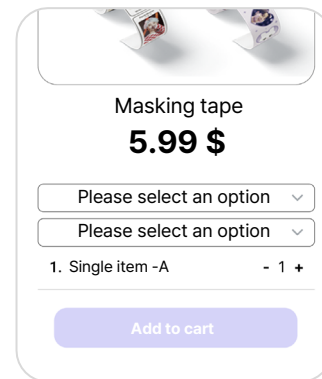
Digital Photo Ticket

Issuance of photo tickets in app



Digital Check-in

Automatic check of tickets with scan



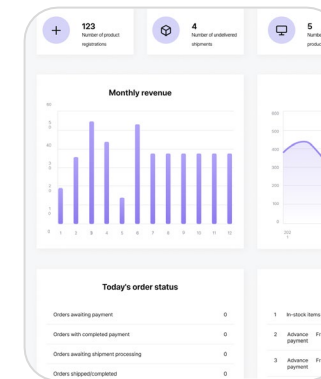
Purchase/Payment DX

Conversion of payments in events to digital

Event Management & Data Check

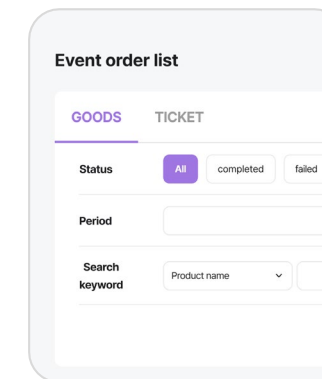
Admin (for Client)

Efficient operation of events and integrated management of data (Client: Homepage masters, entertainment agencies, etc.)



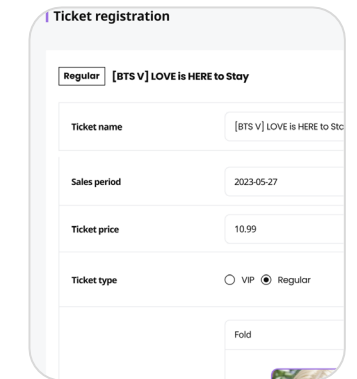
Dashboard

Provision of various event data



Payment & Settlement Management

Real-time check of payment history



Event and Ticket Management

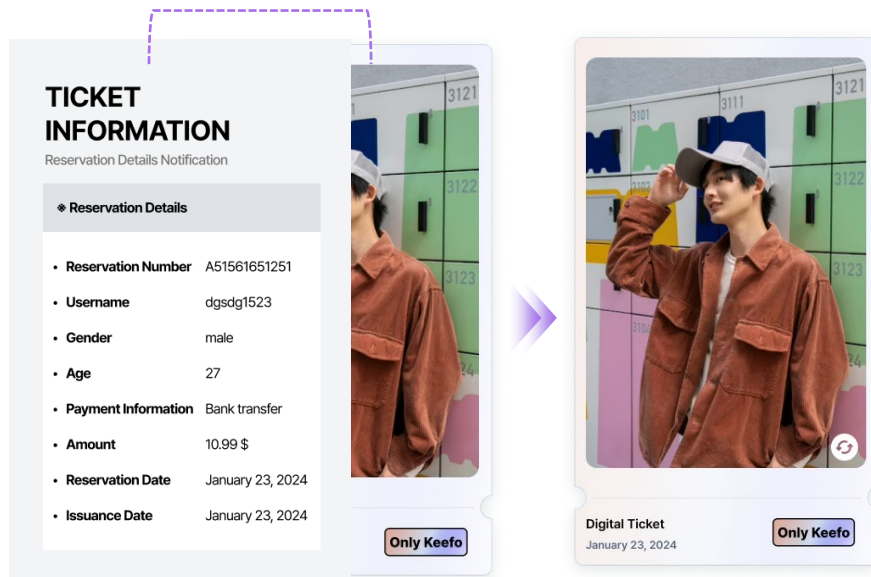
Creation of new events and registration of tickets

6-2. App | Digital Photo Ticket

Through the invisible watermark on the ticket image, reservation information of the ticket holder is stored. While not visible on the image itself, it contains the reservation details, and the image itself serves as the ticket. This ticket can be checked in through scanning.

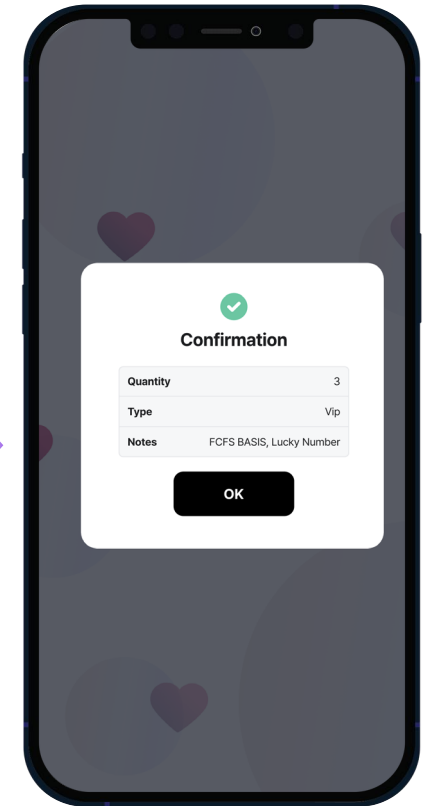
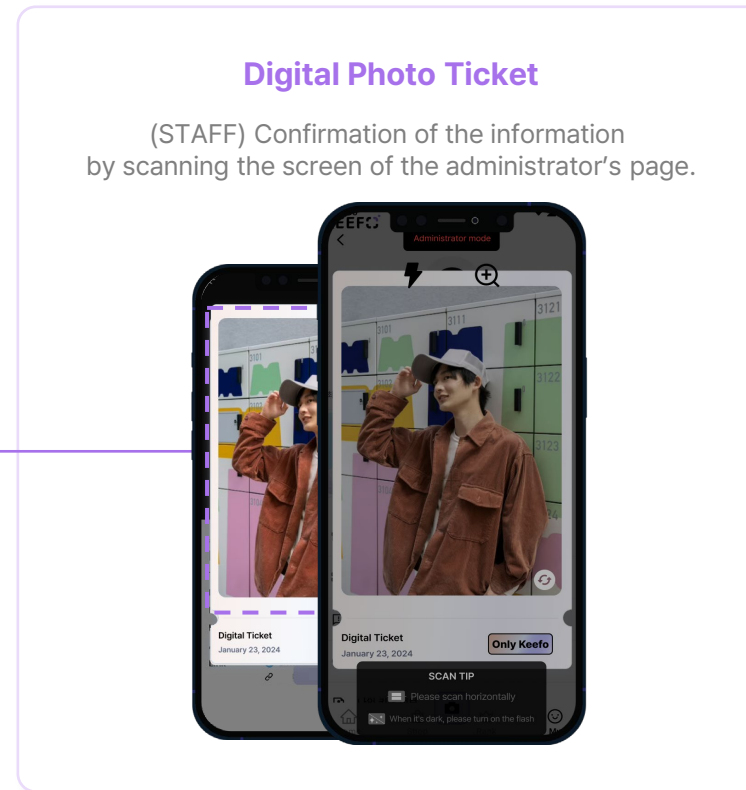
Principle of Digital Photo Ticket

Insert ticket information into the image using the invisible watermark, making it not visible within the image.



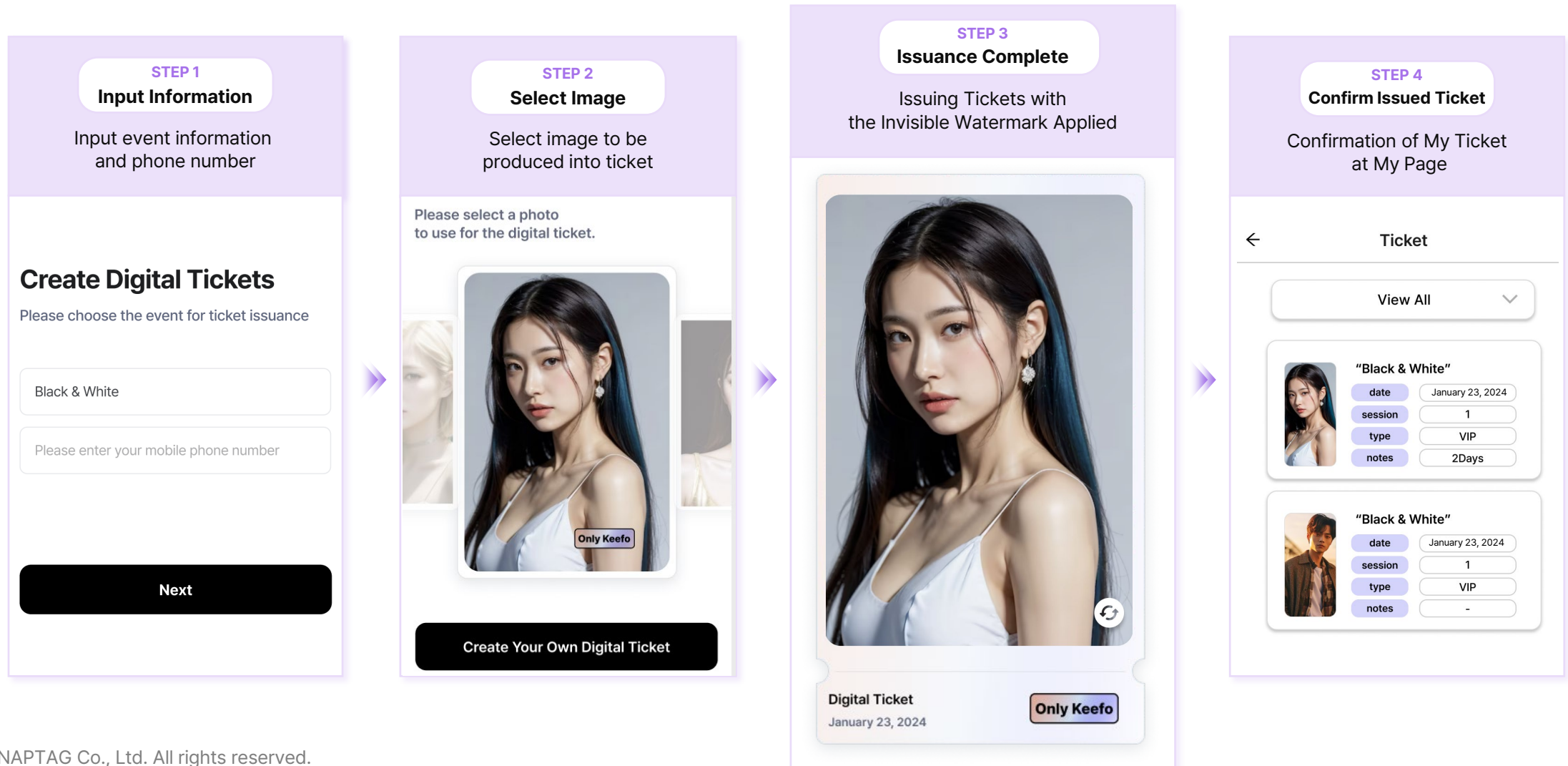
Digital Photo Ticket

(STAFF) Confirmation of the information by scanning the screen of the administrator's page.



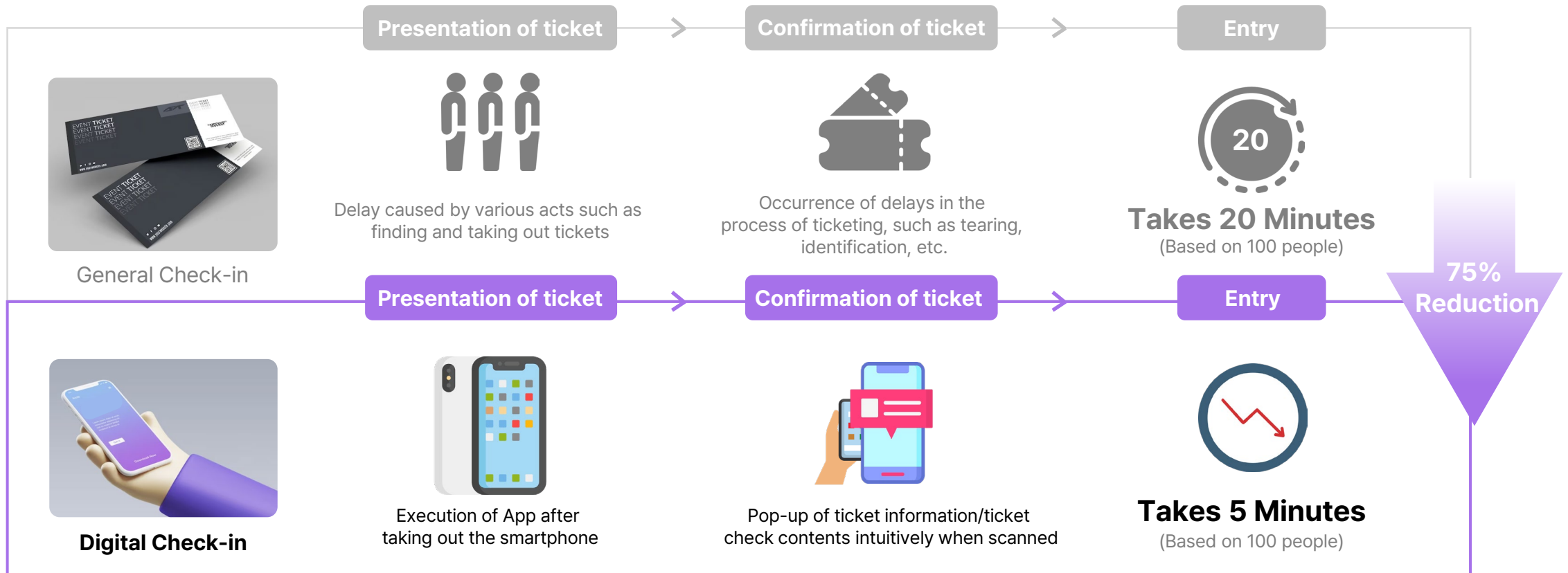
6-2. App | Digital Photo Ticket

You can issue a digital ticket with the image you want so that even one ticket can remain as a precious memory.



6-2. App | Digital Check-in

No more waiting! We provide a quick and pleasant check-in so that you can fully enjoy the event without wasting time.

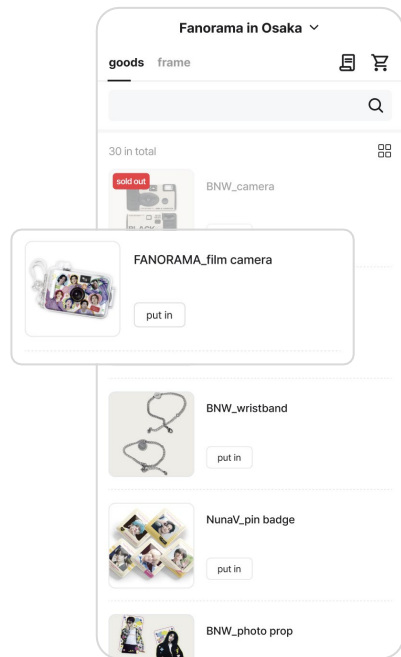


6-2. App | Purchase/Payment DX

All orders and payments that occur at the event at once! It provides the complete digital transformation of purchase/payment.

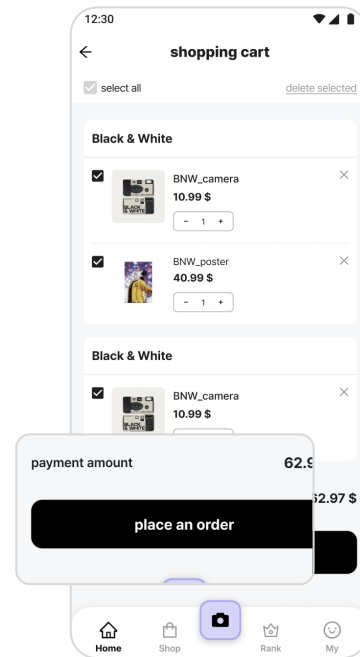
Selection of Products

Confirmation of the list of products sold in the event online



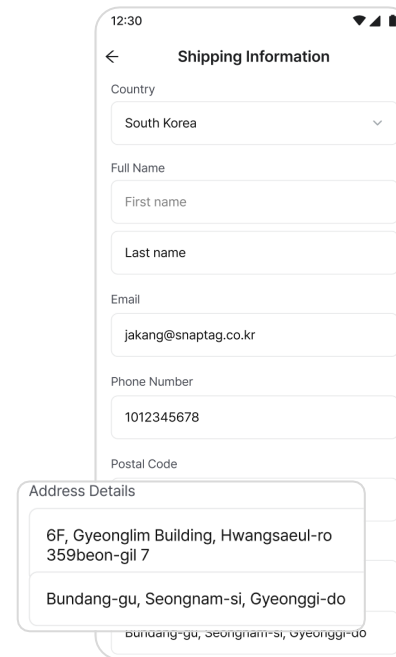
Order and Payment

Payment of the product you want to purchase at once



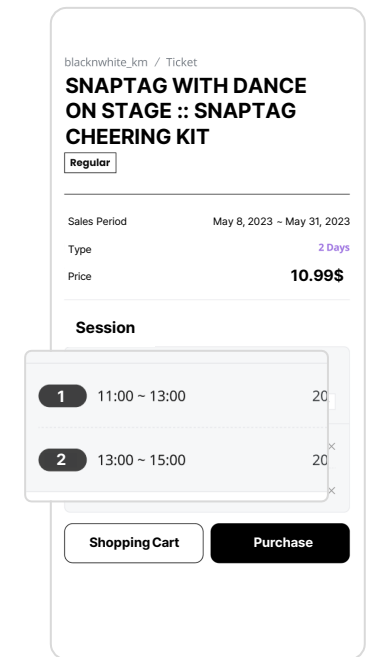
Input of Delivery

Automatic input of the delivery address for non-on-site products



Ticket Payment

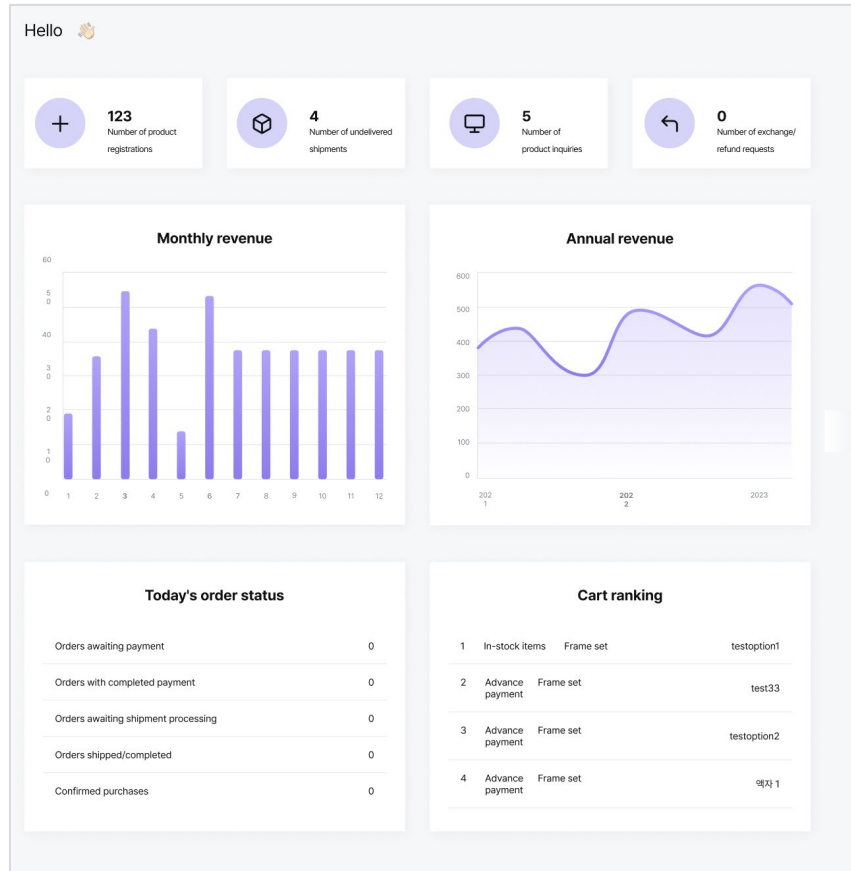
All pre/on-site reservations paid in app



6-2. Admin | Dashboard

In order to collect 'user data' that was difficult to gather during offline events, we now collect and verify it digitally!

We provide various data, including ticket check-in counts and product sales records within the event.



Real-time Data Check



- Identification of the real-time event progress
- Possibility of real-time field response in the event of an issue

Securing of Detailed DB



- Possible to secure detailed DB
- Number of Check-ins, purchase data, etc.

Intuitive UI



- Checking by filtering only the desired data, such as by time, date, and location

Effective Event Planning Through Data

Based on the data results, reflection in the future event composition and planning of events such as marketing.

6-2. Admin | Payment and Order Management

Don't organize the payments and orders that occurred in the market anymore! It's possible to check and manage at a glance in Admin.

Event Management E-commerce Management **Order Management** Exposure Management

Event order list

GOODS **TICKET** Event Management

Status: **All** completed failed Refund processing

Period: [] - []

Search keyword: Product name [] **Search**

Detailed Description

Order Number	Event Name	Product	Customer Name	Phone Number	Total Payment Amount	Status
4258178937	LOVE IS HERE TO STAY	[#BTS] 2023 JUNGKOOK Diary&Slogan C...	sara	010-1234-5678	1.99\$	Payment complete
4230132231	BEBE X JINBARAGI BTS FANART CAFE EVENT & MINI	[#BTS]BNW_film camera	jane	010-5678-5678	1.99\$	Payment failed

<< < 1 2 3 4 5 6 7 8 9 10 > >>

Event order list

GOODS **TICKET**

Status: **All** completed failed Refund processing

Period: [] - []

GOODS ORDER Online payment X

Customer Information **Order Details** Payment success

Customer Name: JANE Order Date and Time: 2023-06-02
 Phone Number: 010-1234-5678 Order Number: 1678174258178937
 Email: JANE@snaptag.co.kr Payment Method: -

Shipping Information

Recipient Name: JANE Address 1: 6F, Gyeongim Building, Hwangsaed-ro 359beon-gil7
 Postal Code: 13590 Address 2: Bundang-gu, Seongnam-si, Gyeonggi-do

Ordered Products Full Refund

NO.	Product Code	Event Name	Product
1	00000009G2YS302A	LOVE IS HERE TO STAY	[#BTS] 2023 JUNGKOOK Diary&Slogan C...
2	00000009G2Y550C2	LOVE IS HERE TO STAY	[#ENHYPEN] 2023 A CHEERING KIT, POL...
3	00000009G2Y5802B	LOVE IS HERE TO STAY	[#BTS] 2023 JUNGKOOK Diary&Slogan Cheering kit[#BTS] 2023 JUNGKOOK Diary&Slogan Cheering kit

Product Price 4.5 \$ + Total Shipping Cost 0 \$ = **Total Order Amount 4.5\$**

6-2. Admin | Event and Ticket Management

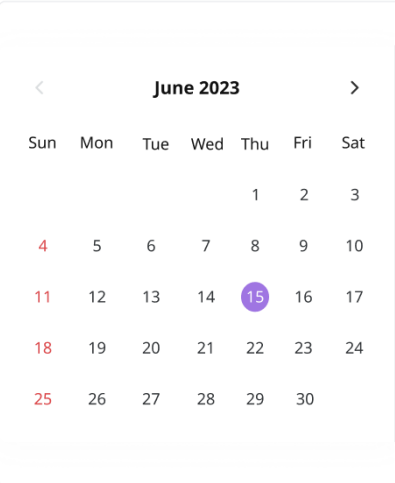
From the registration of basic information which is the first step of the event to the management of public relations exposure which is the last step!

Please proceed all the steps of the event easily through Admin.

Event Registration

Issuing Digital Tickets within the App

Event Title: [BTS V] LOVE is HERE to Stay

Event Date: 

Event Venue: Ho Chi Minh

Event organizer: NUNA V

Session Registration

Session	Start Time	End Time	Attendance
1	11 : 00	~ 12 : 00	230

Ticket registration


Regular [BTS V] LOVE is HERE to Stay

Ticket name: [BTS V] LOVE is HERE to Stay

Sales period: May 27, 2023 → May 28, 2023

Ticket price: 10.99

Ticket type: VIP Regular

Ticket candidate image 

6-3. Implementation Effects

The Five Compelling Reasons to Implement Digital Check-In with SNAPTAG Right Now!



DX Transformation

The digitalization of analog events increases user convenience and reduces the burden of event costs.



Promotion for Event Participation

New customer experiences can increase the participant rate in events with high interest and joy.



Expansion of User Convenience

All activities such as digital check-in and purchase of goods are made possible by App, providing high convenience.



Securing of Segmented Customer DB

In addition to the basic information of the participants, it is possible to secure detailed DBs such as the status by time and stay time.



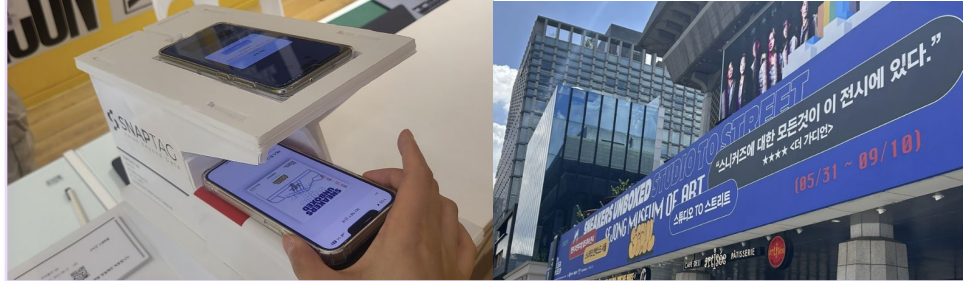
Continuous CRM Marketing

It is possible to plan events based on collected data and to continue marketing using App such as push alarm.

6-4. Usage Reference

Digital check-in events have been conducted in various domestic and international locations.

(Seoul) South Korea's First Large-Scale Sneaker Exhibition
Sneakers Unboxed
May 31, 2023 to September 10, 2023



(Tokyo) BTS Jungkook and Jimin Homepage Master Pop-up Store
Black & White
May 13, 2023 to May 14, 2023



(Seoul) Web 3 Major Conference
Bridge The Hurdle
June 6, 2023 to June 7, 2023



(Hồ Chí Minh) BTS Jungkook Homepage Master Exhibition
We Found Love
May 27, 2023 to May 29



6-4. Usage Reference

A K-pop specialized fan platform with SNAPTAG's digital check-in feature.

How to enjoy K-Pop more fun

KEEFO

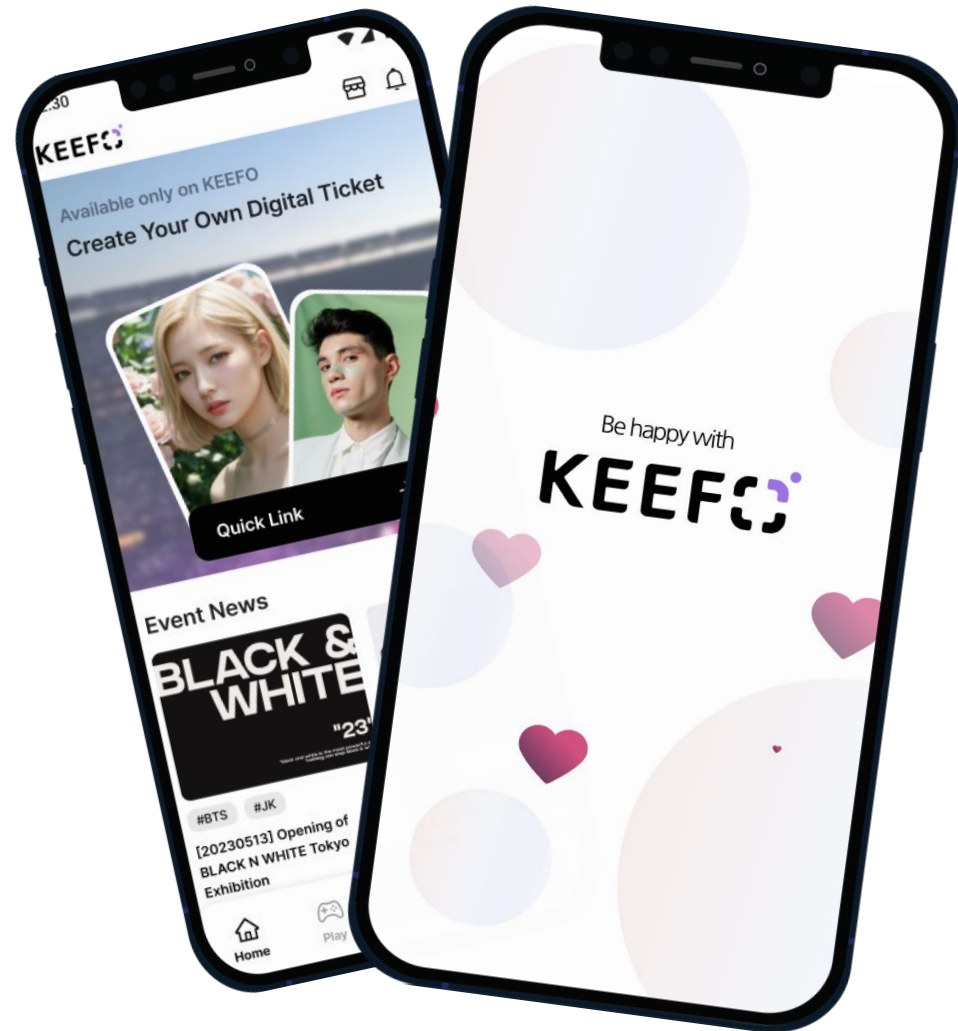
KEEFO is an integrated fan platform for K-Pop fans that allows users to easily enjoy offline events and a variety of information related to K-Pop.

Supported Operating Systems

Android / iOS



If you scan QR Code,
you can download the KEEFO app.

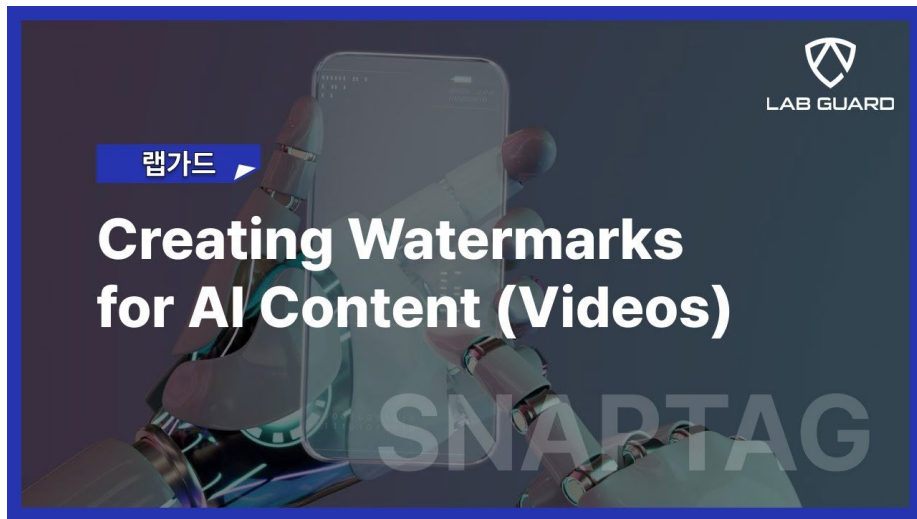




Appendix

- **Demonstration Video**
- **Scan Experience**

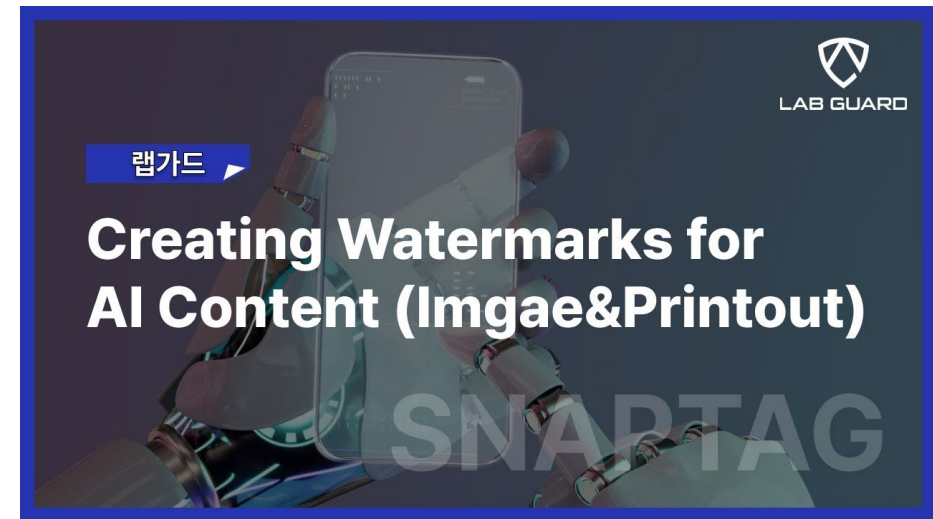
Demonstration Video | Generative AI Content Watermark Authentication



1. Demonstration of generative AI video watermark

Identification of the generator and content information by scanning watermarks applied in generative AI videos

<https://www.youtube.com/watch?v=1a-Hrf5gV0c>

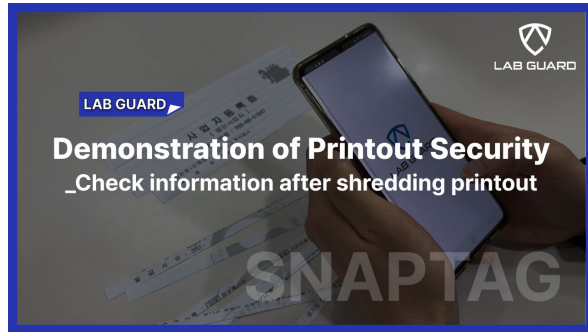


2. Demonstration of generative AI images and print watermarks

Identification of the generator and content information by scanning watermarks applied in generative AI images and output

<https://www.youtube.com/watch?v=1ID6W8toIH>

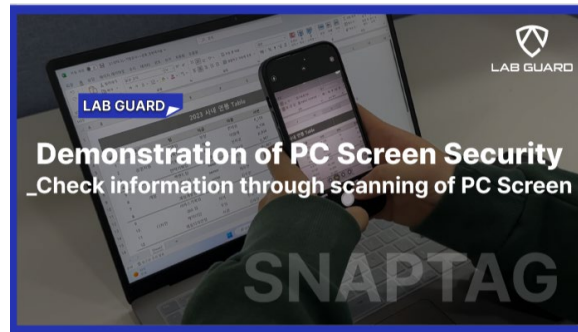
Demonstration Video | LAB Guard



1. Demonstration of scanning after destroying the printouts

Demonstration video on the identification of document information in the case of scanning after printout or destruction

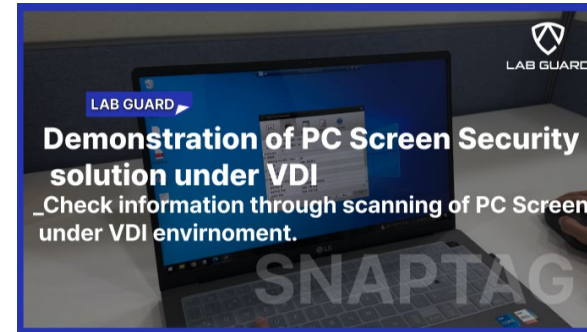
https://www.youtube.com/watch?v=yTfonf_MayM



2. Demonstration of PC screen security

Demonstration video on PC screen security. Also, the possibility of identifying the relevant information in the case of scanning the pictures taken.

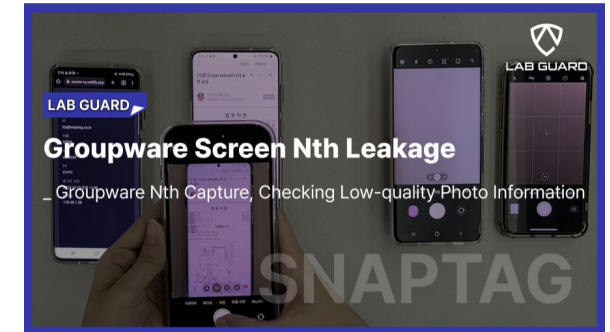
<https://www.youtube.com/watch?v=GUddmJWqZOw>



3. Demonstration of the VDI environment security

Possible to identify the leaker's information even in the case of the screen security operation of the VDI environment and leakage to VDI's external environment

<https://www.youtube.com/watch?v=229iDrdsztk>

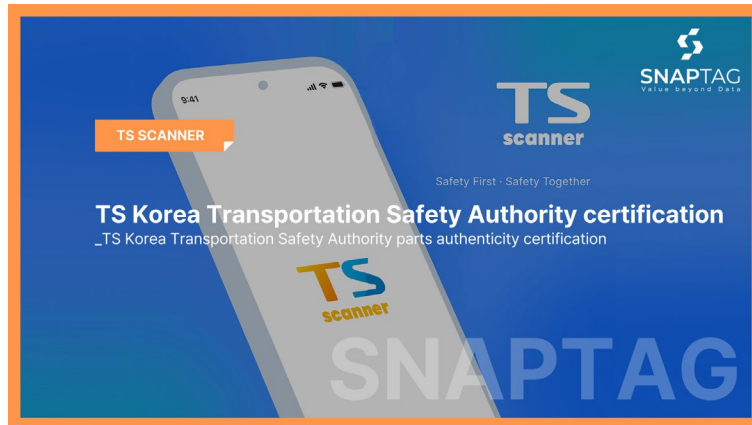


4. Groupware App Data Leakage Tracking Demonstration Video

Demonstration video showing how user information can be identified when the app screen is leaked using LAB Guard-M.

https://www.youtube.com/watch?v=95KngUfDU_Y

Demonstration Video | IP Authentication



1. TS Scanner APP scanning demonstration

A demonstration video showing how to determine whether a part is genuine when scanning the TS Korea Transportation Safety Authority labels.

<https://youtu.be/fi1u5YssgaY>



2. IUFC Photocard kiosk demonstration

Incheon United FC photocard purchase and scanning demonstration video through dedicated APP.

<https://youtu.be/fi1u5YssgaY>

Scan Experience

Download the S Code Scanner app from App Store and Google Play and scan it yourself!

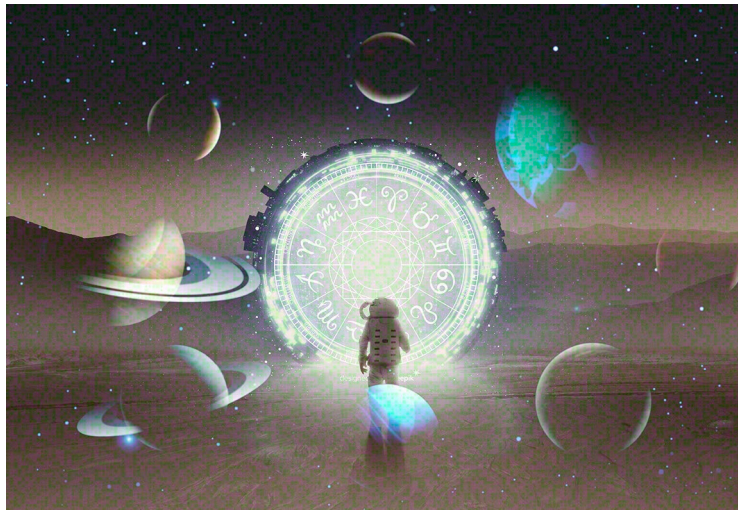


If you scan QR Code,
you can download the S Code Scanner app.

Before Application



Invisible Watermark Application 1



Invisible Watermark Application 2



* Appendix

Scan Experience

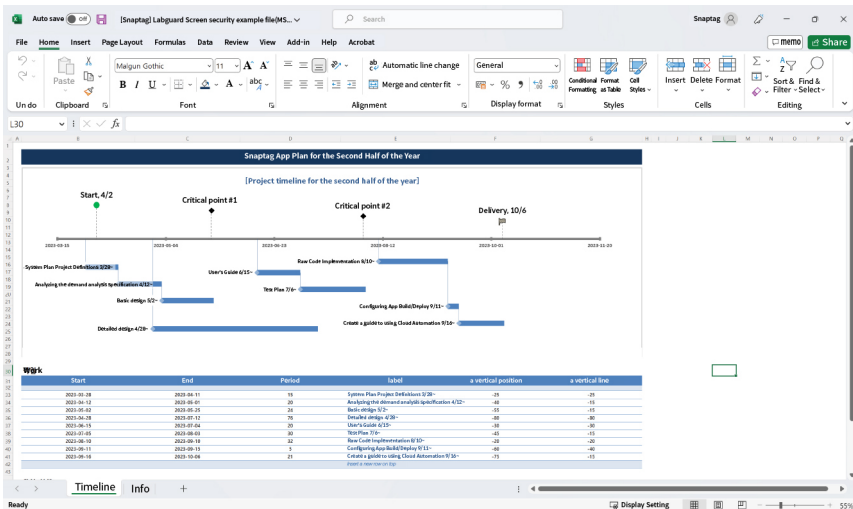
Download the S Code Scanner App from App Store and Google Play and scan it yourself!

* The images within this experience page are sample images created to be scannable by the S Code Scanner App, and the actual verification module for scanning LAB Guard is only provided to administrators.

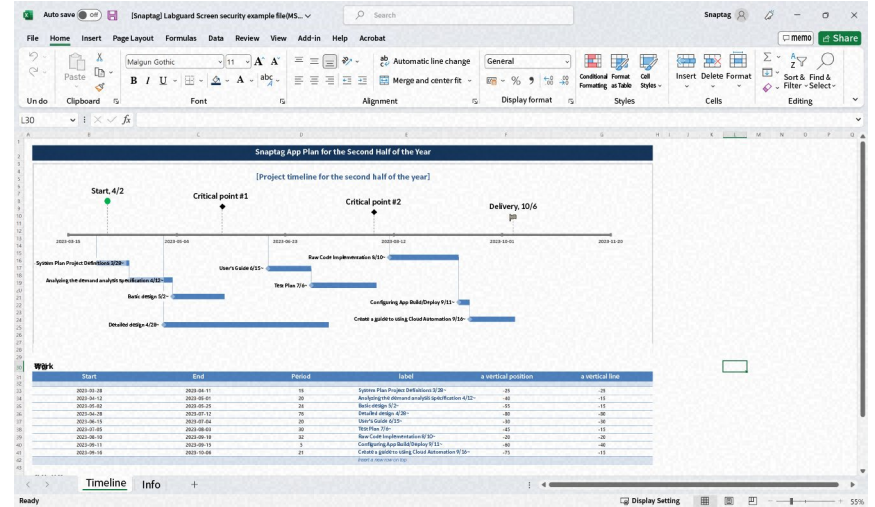


Scan the QR Code and you can download the S Code Scanner App.

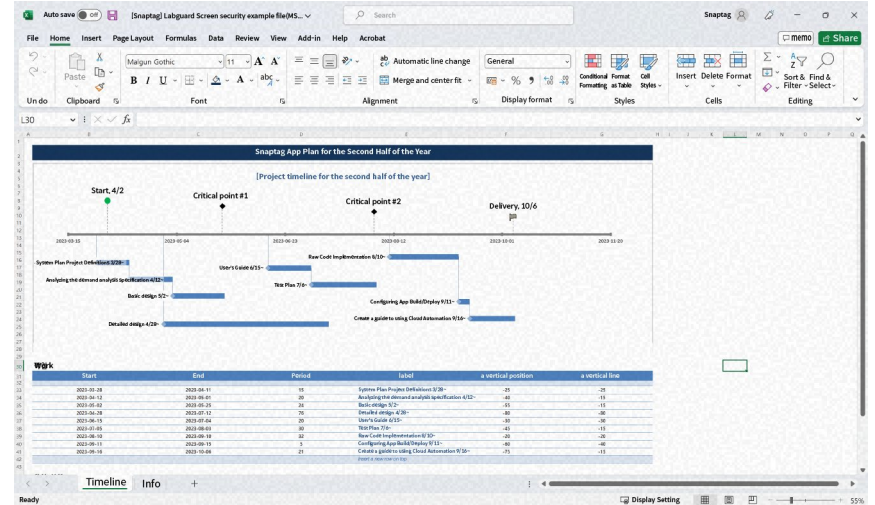
Before Application



LAB Guard Application 1



LAB Guard Application 2



SNAPTAG

**Aims to be the global technology standard
for invisible watermarks**



THANK YOU

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