

How to Implement an Email Subscription and Delivery System

Using **COSCUP** Newsletter Subscription as an Example

Toomore Chiang

COSCUP 2023

2023-07-30 (Day 2) ~ 13:00 - 13:30 TR511

What's **COSCUP**

Conference for Open Source Coders, Users, Promoters

- COSCUP is a technology conference that focuses on **open-source** related topics.
- It is for developers, users, and promoters (Coders, Users, Promoters) to participate in.
- It is a **free** and **registration-free** conference.
- Usually held at the end of **July** or beginning of **August** at the National Taiwan University of Science and Technology (臺灣科技大學) .
- Each track of the conference is **self-reviewed** and **self-organized** by **open source community partners**.
- The conference usually attracts **1500** to **2000** attendees.

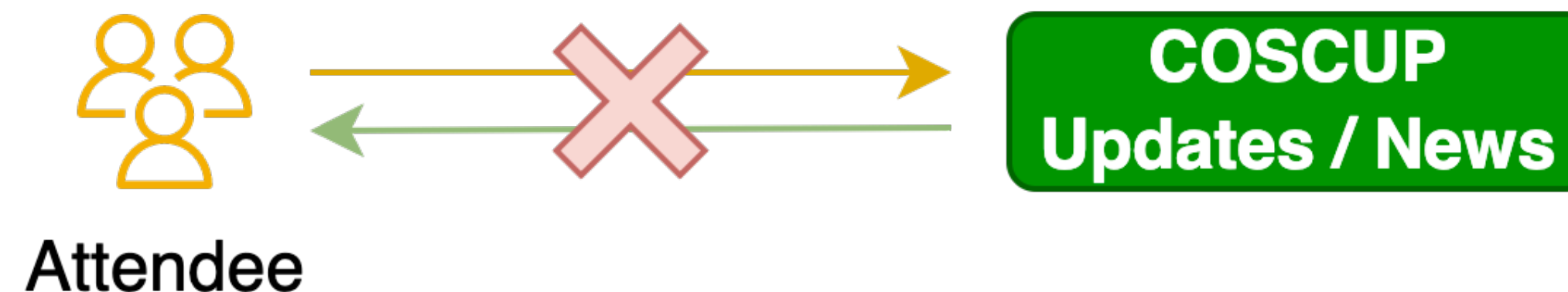
Open → Open the door

Why we turn to no longer require registration and open to anyone.

1. Since 2020, we have aimed to make **COSCUP** more physically open. The door is always open.
2. Additionally, we want to know how many people in Taiwan or from other countries who are interested in open source will come to join the annual conference.
3. The limit is ourselves. Let's not limit ourselves to 1200; instead, aim for 2000 or more.
4. But how do we confirm that "**2000+**" users have joined us? We encourage them to wear **the badges we provide** at **COSCUP** and calculate the number of badges issued.

Open is great, but ...

1. ... but it can also **disconnect** us from potential attendees.
2. ... but it may **exclude** those who still want to follow updates from **COSCUP**.
3. ... but it may not be suitable for **announcing major news** to everyone.



Build from scratch

Before build the system from scratch

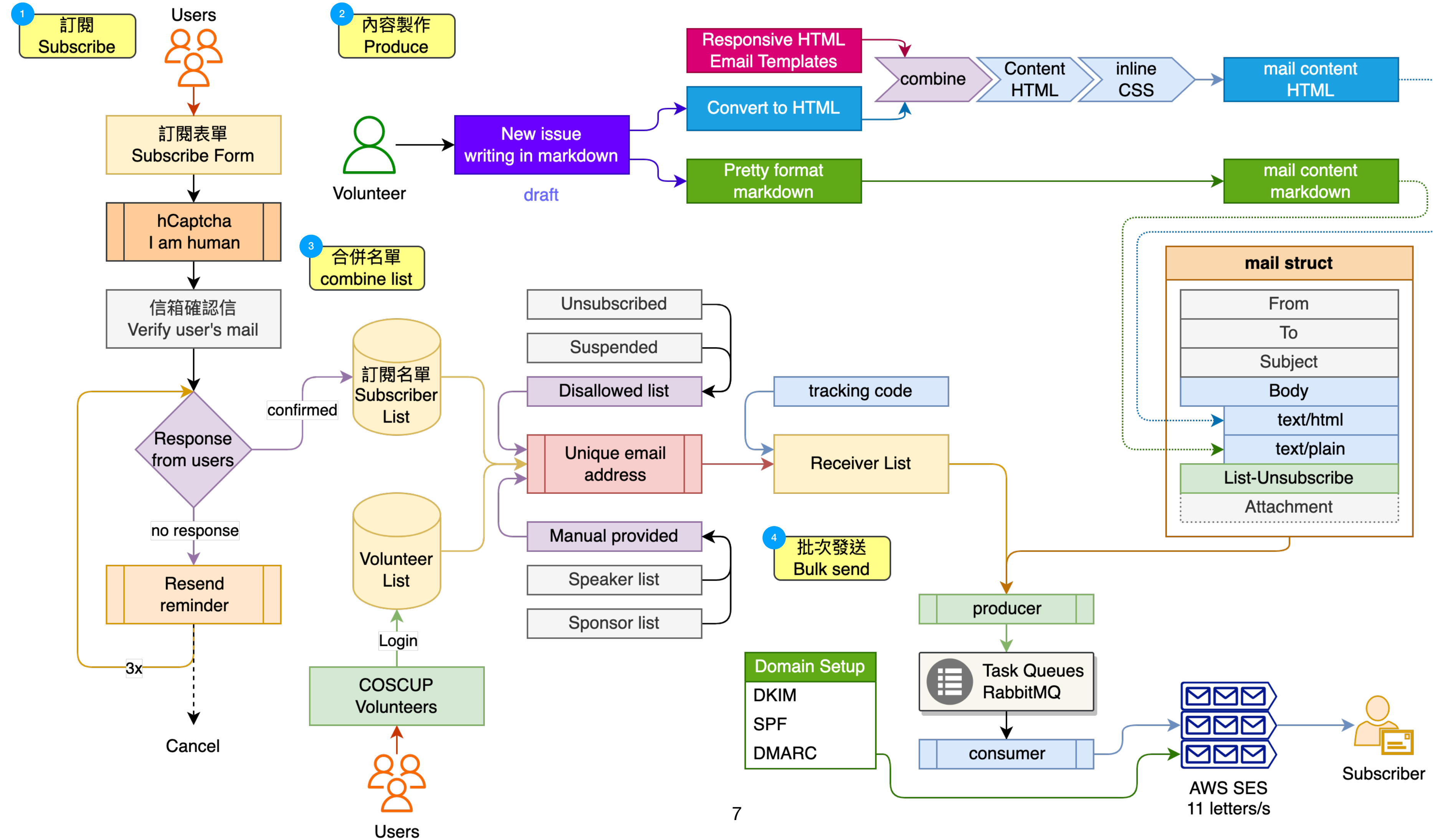
What we had established ...

- **Send bulk and user list** in csv format file.



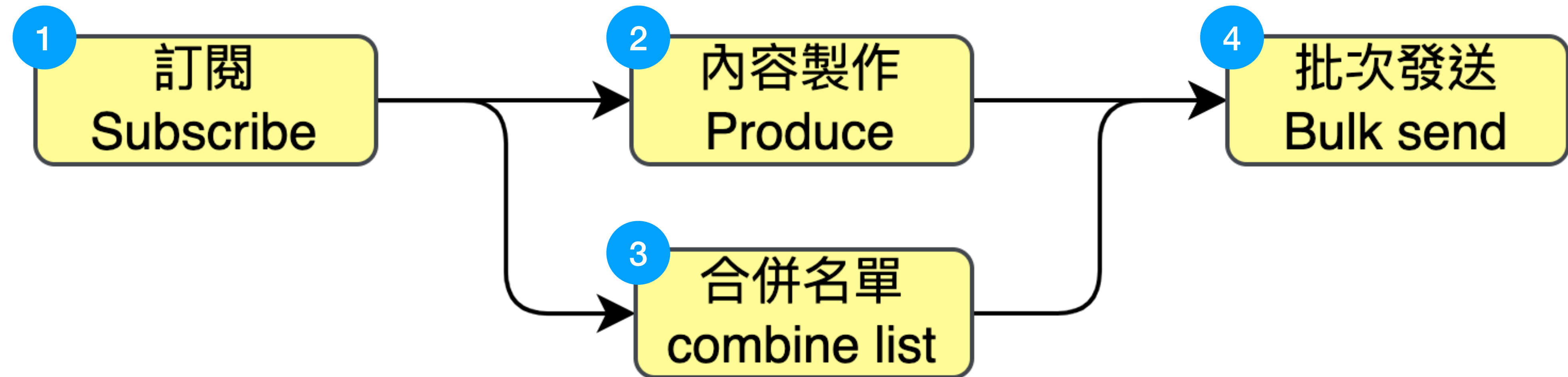
Workflow

Subscribe → Produce → Lists → Deliver



Subscribe to Deliver

There are four parts to the process.

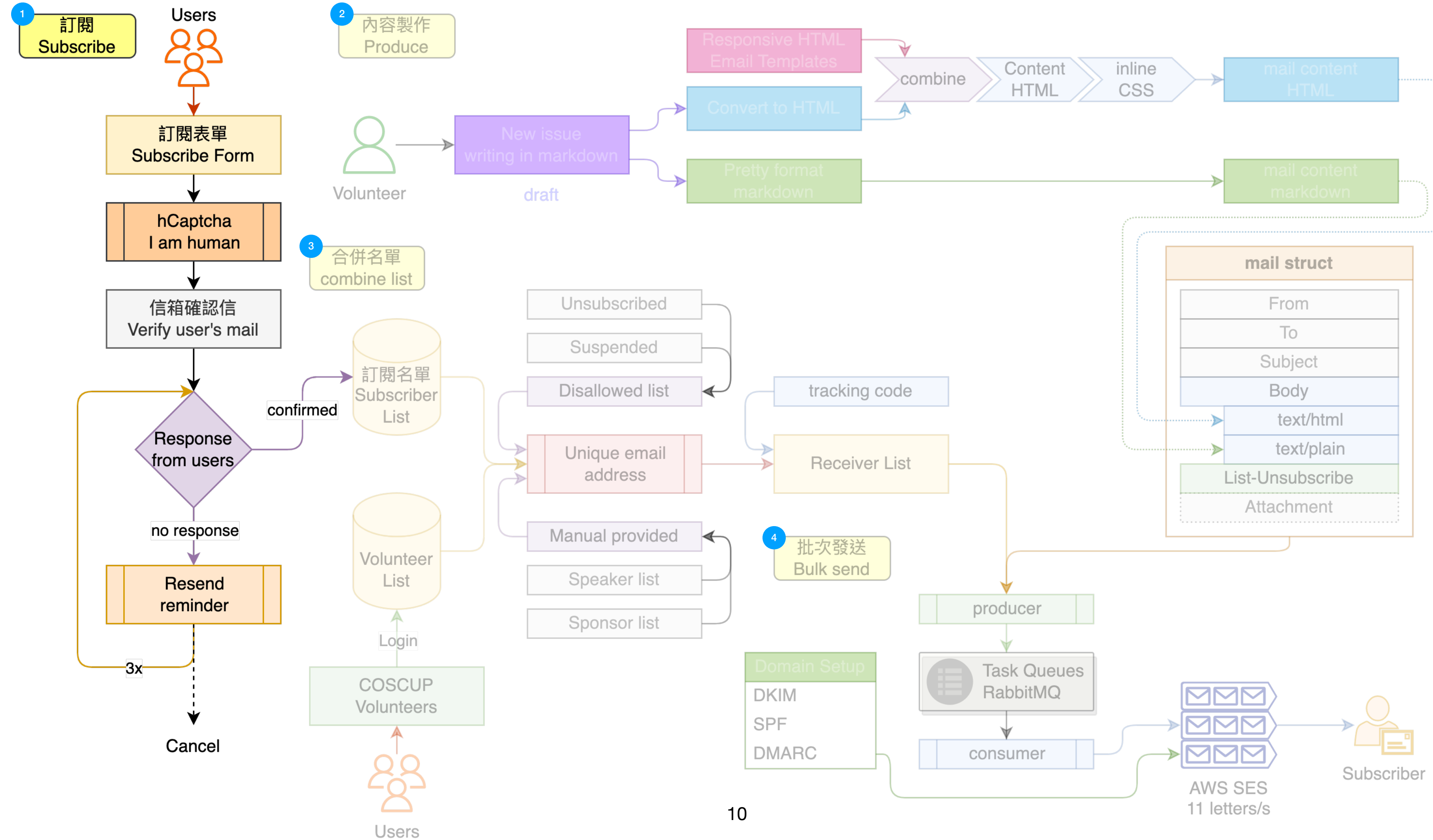


- 1 How to build a subscribe system from scratch.
- 2 How to create email content.
- 3 How to combine user lists from multiple sources.
- 4 How to bulk send emails to users.

① Subscribe!

Workflow: ① Subscribe!

Subscribe* → Produce → Lists → Deliver



① Subscribe!

Subscribe Form

1. Email
2. Name
3. I am human
 - hCaptcha

使用範圍 / Agreement

訂閱只會收到 COSCUP 活動期間的訊息通知。在訂閱後會有確認信與取消訂閱的方式說明。如有其他問題詢問，可以寄信到 attentee@coscup.org。

We will only send information related to COSCUP activities. After submitting, you will receive a validation email, and the way to unsubscribe. If you have any questions, please email us at attentee@coscup.org.


同意 COSCUP 的使用規範 / accepted

Mail

Name

我不是機器人 / I am human

I am human


hCaptcha
Privacy - Terms

 訂閱 / Subscribe

@ 2110 +1 subscribers

<https://secretary.coscup.org/subscribe/coscup>

① Subscribe!

Verify / Confirm Email

- Send the verify / confirm mail to the subscriber.

📧 信箱確認 / Email confirmed

已確認信箱，感謝訂閱。 Email confirmed, thanks.

[Verify] 驗證 COSCUP 電子報訂閱 / Your Subscription (1592722812) >



COSCUP Secretary <secretary@coscup.org> Jun 21, 2020, 3:00 PM ☆ Reply to all to Toomore ▾



Hi Toomore Chiang,

感謝訂閱 COSCUP 電子報，首先需要確認您的郵件信箱是否正確收到訊息，請透過以下的連結完成確認！

https://secretary.coscup.org/subscriber/verify_mail/11807cf4b652f7f3ae3367e18106f01690bf00de06e869d482731e91f9a63735

Please verify your mail address through click this link, thanks

如果您沒有訂閱，可以直接忽略確認信，或是直接回信還封信，將由行政組協助處理。

If you didn't subscribe, please ignore this or reply this mail to COSCUP Secretary Team for help.



COSCUP

1 Subscribe!

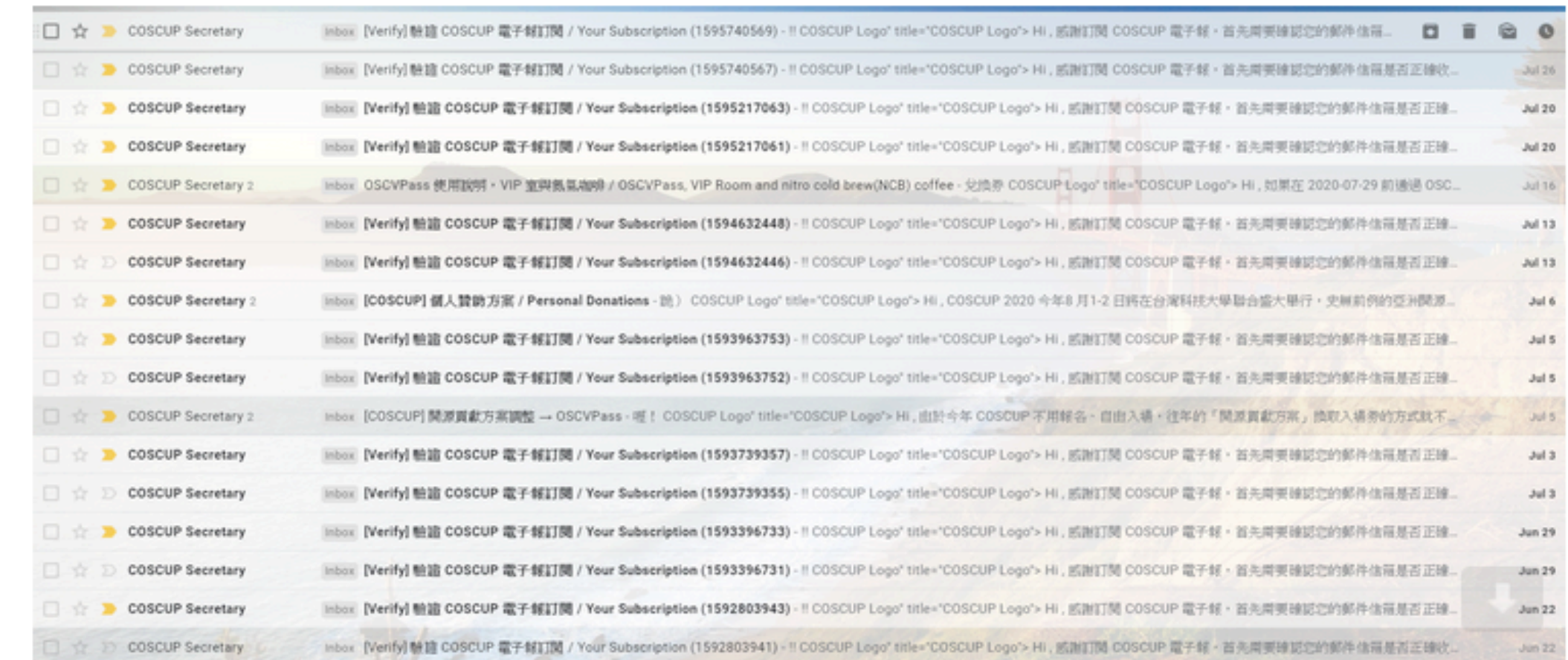
Reminder to Confirm

- Reminder the user to confirm.
- Don't bother users, set the limit times for auto-send reminder letters.

to COSCUP ▾

您好，

我有訂閱沒錯，但請問是要驗證幾次？

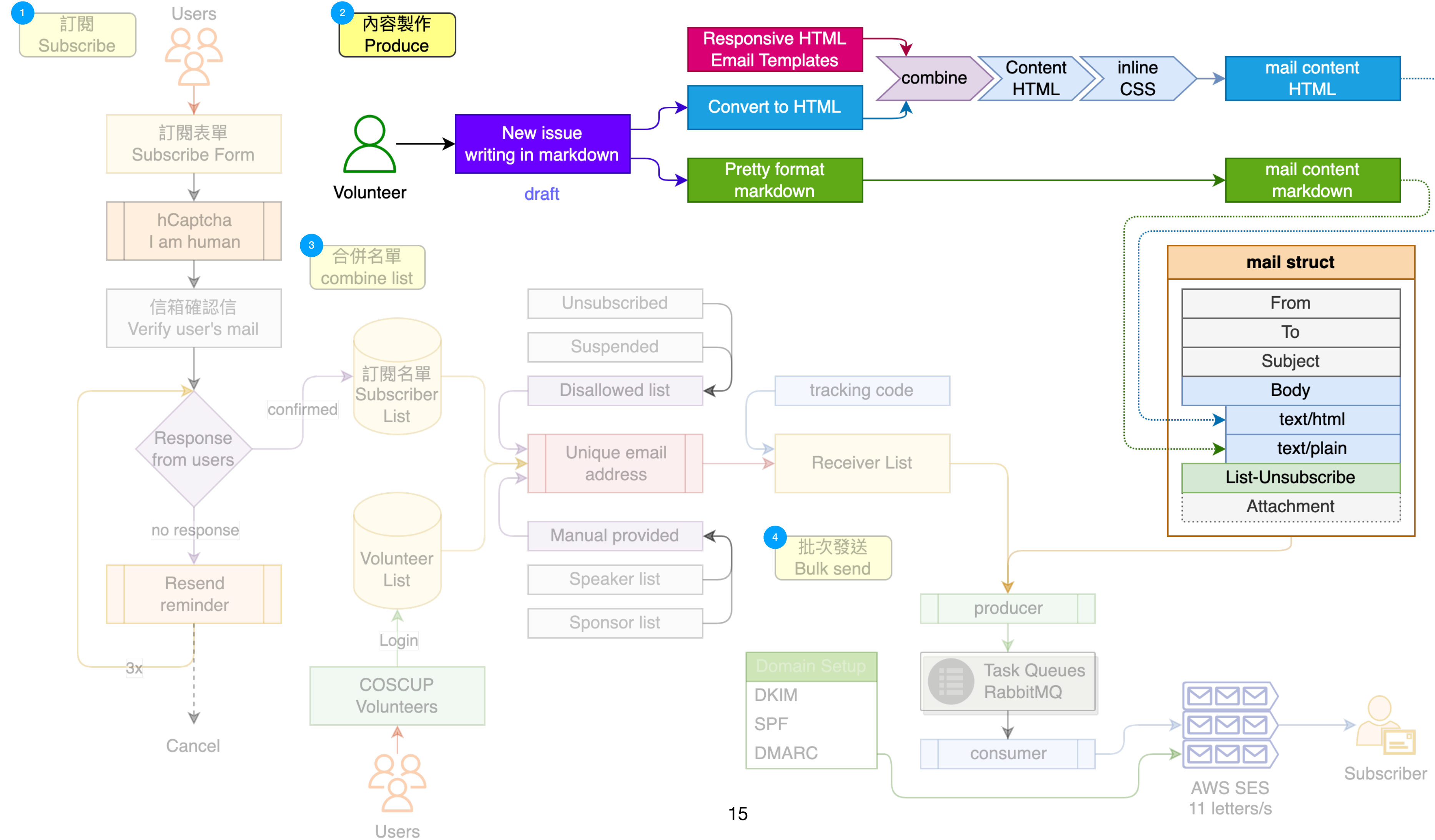


Sender	Subject	Date
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1595740569) - !! COSCUP Logo	Jul 26
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1595740567) - !! COSCUP Logo	Jul 20
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1595217063) - !! COSCUP Logo	Jul 20
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1595217061) - !! COSCUP Logo	Jul 20
COSCUP Secretary 2	OSCVPass 使用說明 · VIP 室與氣氛咖啡 / OSCVPass, VIP Room and nitro cold brew(NCB) coffee - 兌換券	Jul 16
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1594632448) - !! COSCUP Logo	Jul 13
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1594632446) - !! COSCUP Logo	Jul 13
COSCUP Secretary 2	[COSCUP] 個人贊助方案 / Personal Donations - 誌) COSCUP Logo	Jul 6
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1593963753) - !! COSCUP Logo	Jul 5
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1593963752) - !! COSCUP Logo	Jul 5
COSCUP Secretary 2	[COSCUP] 開源貢獻方案調整 -- OSCVPass · 囉！ COSCUP Logo	Jul 5
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1593739357) - !! COSCUP Logo	Jul 3
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1593739355) - !! COSCUP Logo	Jul 3
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1593396733) - !! COSCUP Logo	Jun 29
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1593396731) - !! COSCUP Logo	Jun 29
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1592803943) - !! COSCUP Logo	Jun 22
COSCUP Secretary	[Verify] 歡迎 COSCUP 電子訂閱 / Your Subscription (1592803941) - !! COSCUP Logo	Jun 22

② Produce

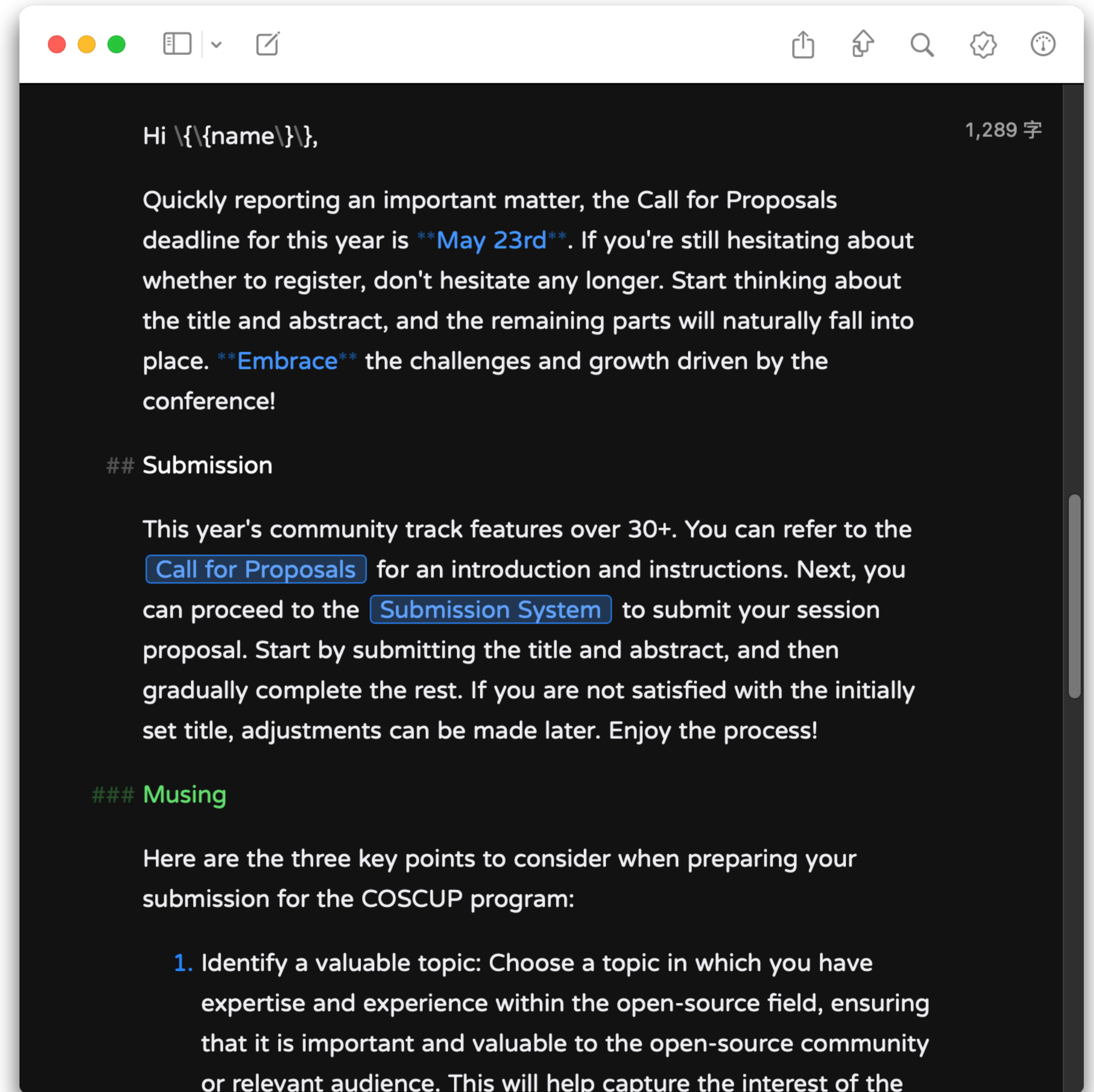
Workflow

Subscribe → Produce* → Lists → Deliver



② Produce Markdown

- Write the content in Markdown format.
- At this step, we could force on the content what we want to communicate with subscriber.



Ulysses on macOS

② Produce Email Templates

- Using the responsive email templates to design.
- Don't write this templates from scratch, there are more open source templates can be used.
- Keys: responsive email.

COSCUP2013Secretary-Toolkit / scripts / 2023 / tpl / coscup_2023.html

Code

Blame

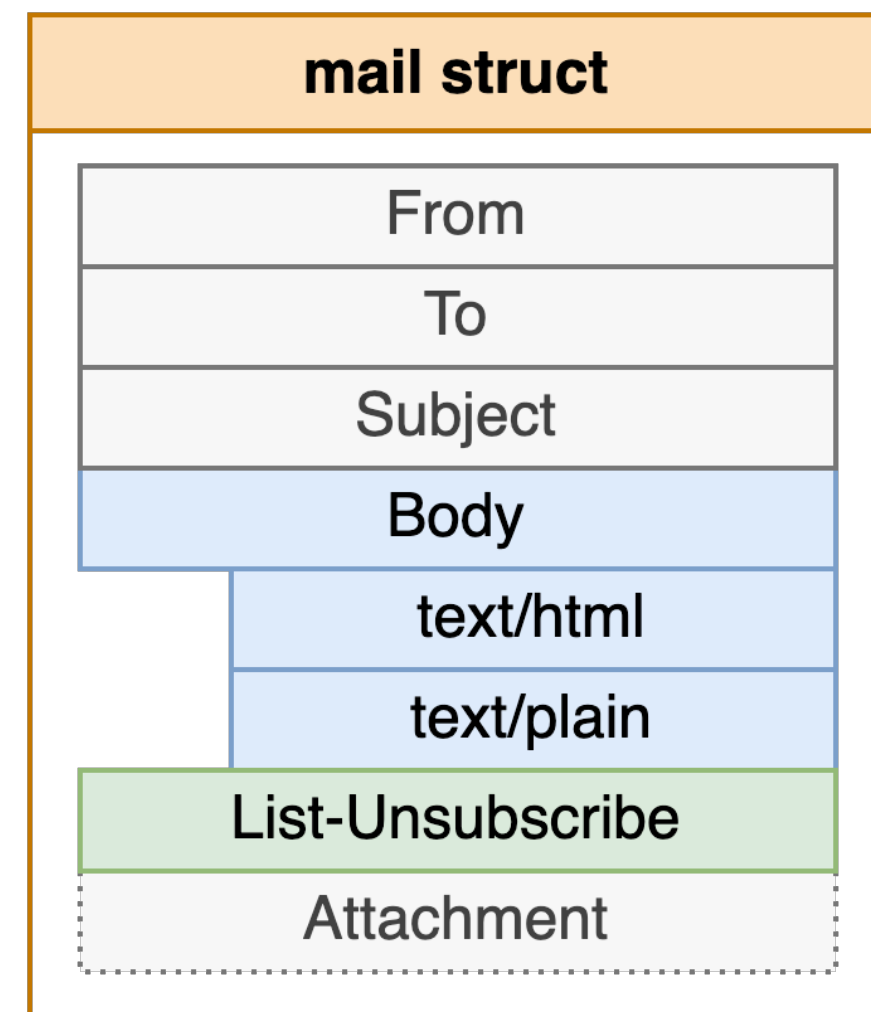
466 lines (432 loc) · 16.8 KB

```
209      /* -----
210          RESPONSIVE AND MOBILE FRIENDLY STYLES
211      ----- */
212      @media only screen and (max-width: 580px) {
213          table[class=body] h1 {
214              font-size: 28px !important;
215              margin-bottom: 10px !important; }
216          table[class=body] p,
217          table[class=body] ul,
218          table[class=body] ol,
219          table[class=body] td,
220          table[class=body] span,
221          table[class=body] a {
222              font-size: 16px !important; }
223          table[class=body] .wrapper,
224          table[class=body] .article {
225              padding: 10px !important; }
226          table[class=body] .content {
227              padding: 0 !important; }
228          table[class=body] .container {
229              padding: 0 !important;
230              width: 100% !important; }
231          table[class=body] .main {
```

② Produce

Export to md / HTML

- We need two types of raw text format for email content body.
- Markdown for text/plain.
- HTML for text/html.



2 Produce

Inline the CSS into HTML

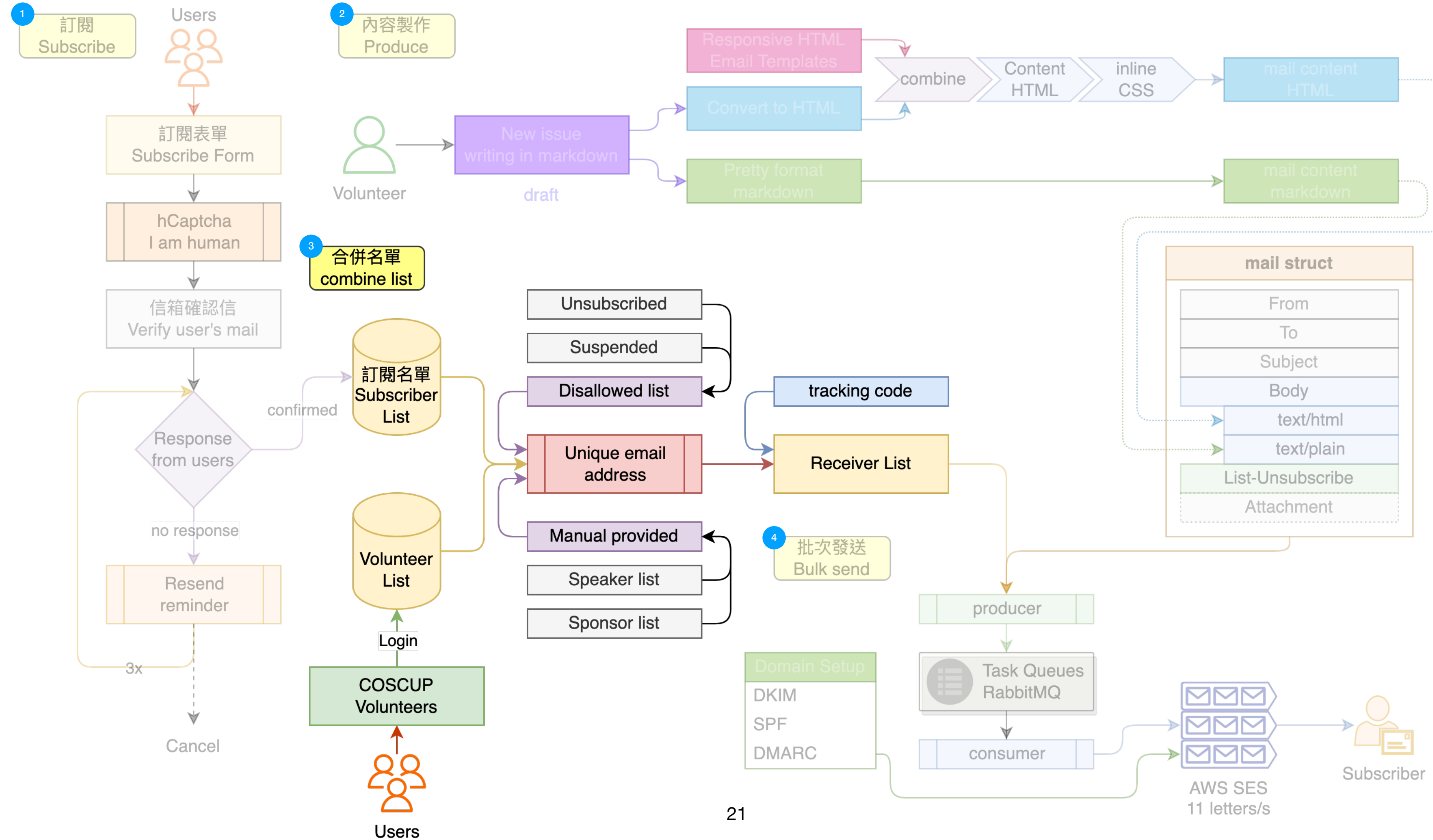
- Combine the CSS into HTML tags.
- To make sure most of the mail clients could recognize the css layout effects in HTML inline.
- ... and remove unused css definition.

```
<body class="" style="background-color:#ffffff;font-family:sans-serif;-webkit-1
  <table border="0" cellpadding="0" cellspacing="0" class="body" style="border-
    <tbody><tr>
      <td style="font-family:sans-serif;font-size:14px;vertical-align:top"> </td>
      <td class="container" style="font-family:sans-serif;font-size:14px;vertical-align:top">
        <div class="content" style="box-sizing:border-box;display:block;margin:0 auto;
          width:600px">
          <!-- START CENTERED WHITE CONTAINER -->
          <span class="preheader" style="color:transparent;display:none;height:1em;
            font-size:1em">
            <table class="main" style="border-collapse:collapse;mso-table-lspace:0pt;
              width:100%;>
              <tbody>
                <tr>
                  <td style="text-align:center;vertical-align:top">
                    <!-- START MAIN CONTENT AREA -->
                    <tbody><tr>
                      <td class="wrapper" style="font-family:sans-serif;font-size:14px;
                        width:100%;>
                        <table border="0" cellpadding="0" cellspacing="0" style="border-collapse:collapse;
                          width:100%;>
                          <tbody><tr>
                            <td style="font-family:sans-serif;font-size:14px;vertical-align:top">
                              <p class="align-right" style="font-family:sans-serif;font-size:14px;
                                font-weight:bold">
                                <p style="font-family:sans-serif;font-size:14px;font-weight:bold">
                                <p class="align-center" style="font-family:sans-serif;font-size:14px;
                                  font-weight:bold">
                                  <p style="font-family:sans-serif;font-size:14px;font-weight:bold">
                                  <p style="font-family:sans-serif;font-size:14px;font-weight:bold">
                                  <p style="font-family:sans-serif;font-size:14px;font-weight:bold">
                                  <p style="font-family:sans-serif;font-size:14px;font-weight:bold">
                                  <table border="0" cellpadding="0" cellspacing="0" class="
                                    <tbody>
                                      <tr>
                                        <td align="center" style="font-family:sans-serif;font-size:14px;
                                          font-weight:bold">
                                          <table border="0" cellpadding="0" cellspacing="0" style="border-collapse:collapse;
                                            width:100%;>
                                            <tbody>
                                              <tr>
                                                <td align="center" style="font-family:sans-serif;font-size:14px;
                                                  font-weight:bold">
```

③ Combine List

Workflow

Subscribe → Produce → Lists* → Deliver



③ Combine List

Case with "+"

- User's mail using '+' for splitting the purpose.
- The same email has variant format.

from: COSCUP Secretary <secretary@coscup.org>
to: Toomore Chiang <toomore0929+coscup@gmail.com>
date: Jun 21, 2020, 3:00 PM
subject: [Verify] 驗證 COSCUP 電子報訂閱 / Your Subscription

ma
sig
s

from: COSCUP Secretary <secretary@coscup.org>
to: Toomore Chiang <toomore0929+coscup2@gmail.com>
date: Jun 22, 2020, 1:09 PM
subject: [Verify] 驗證 COSCUP 電子報訂閱 / Your Subscription
(1592802570)
mailed-by: amazonses.com
signed-by: coscup.org
security:  Standard encryption (TLS) [Learn more](#)
 Important mainly because it was sent directly to you.

③ Combine List

Unique the email format

1. "foo.bar+coscup@example.com"

- Remove +tag.

2. "foo.bar@example.com"

- Remove "."

3. "foobar@example.com"

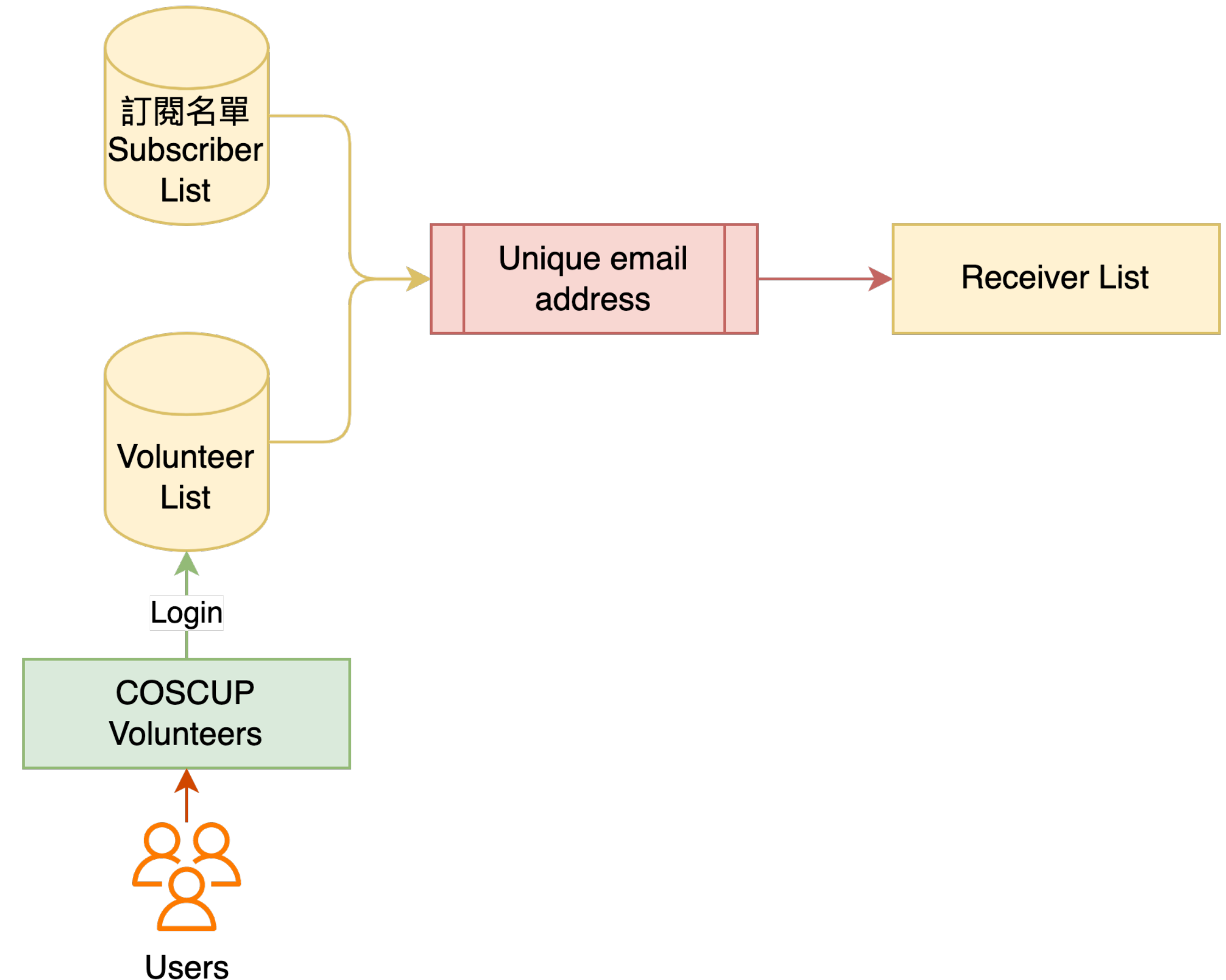
- Unique!

```
145     @staticmethod
146     def format_mail(mail):
147         '''format mail
148
149         clean '.', '+', lower
150         '''
151         mail = mail.lower().strip()
152         if '+' in mail:
153             mail = re.sub(r'(\+[a-z0-9]+)@', '@', mail)
154
155         _mail = mail.split('@')
156
157         if '.' in _mail[0]:
158             return '%s@%s' % (_mail[0].replace('.', ''), _mail[1])
159
160         return mail
```

③ Combine List

From two database

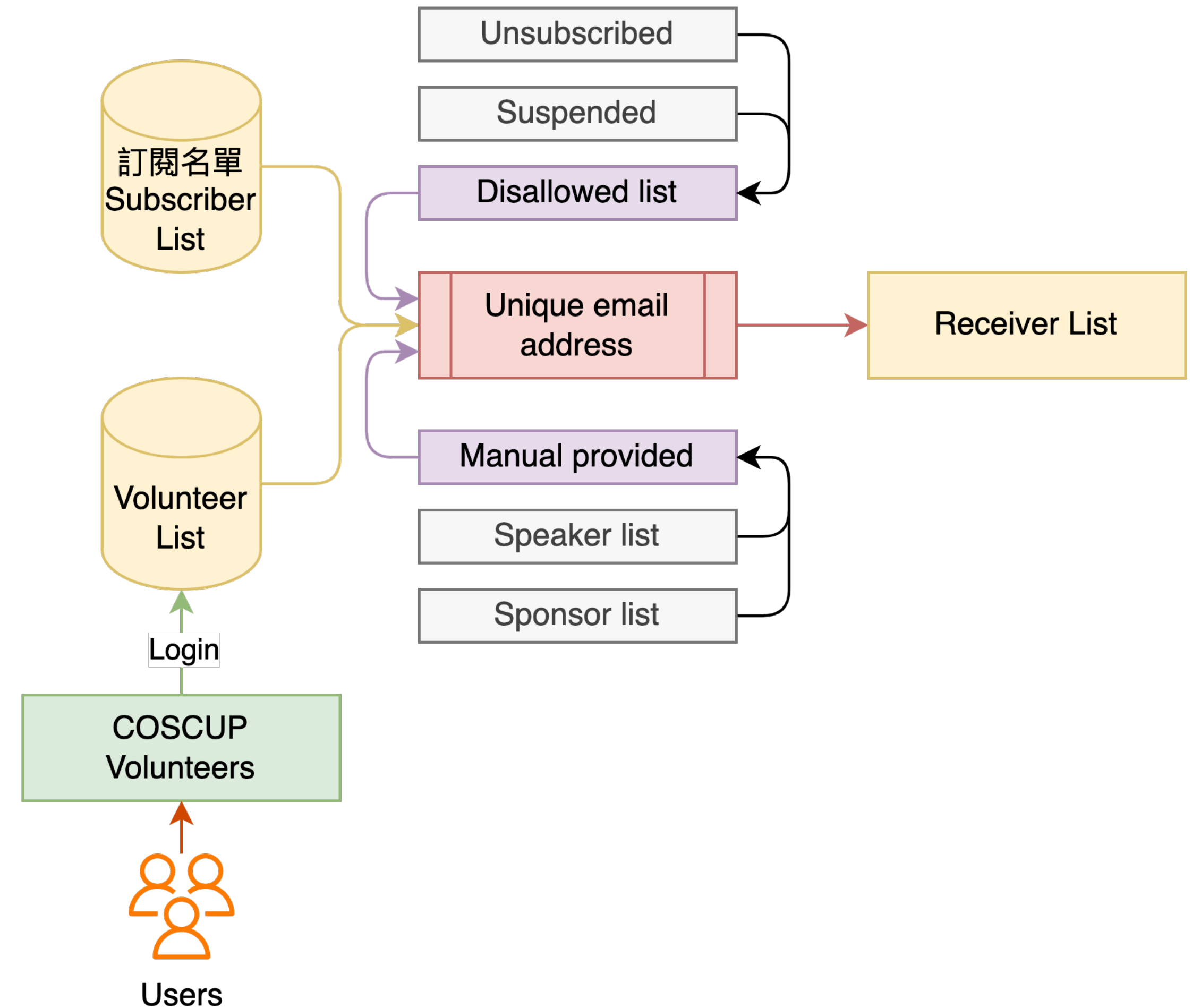
- Combine the users list from the subscriber and volunteers database.
- Unique the emails, filter out the same users.



③ Combine List

Filter and Append

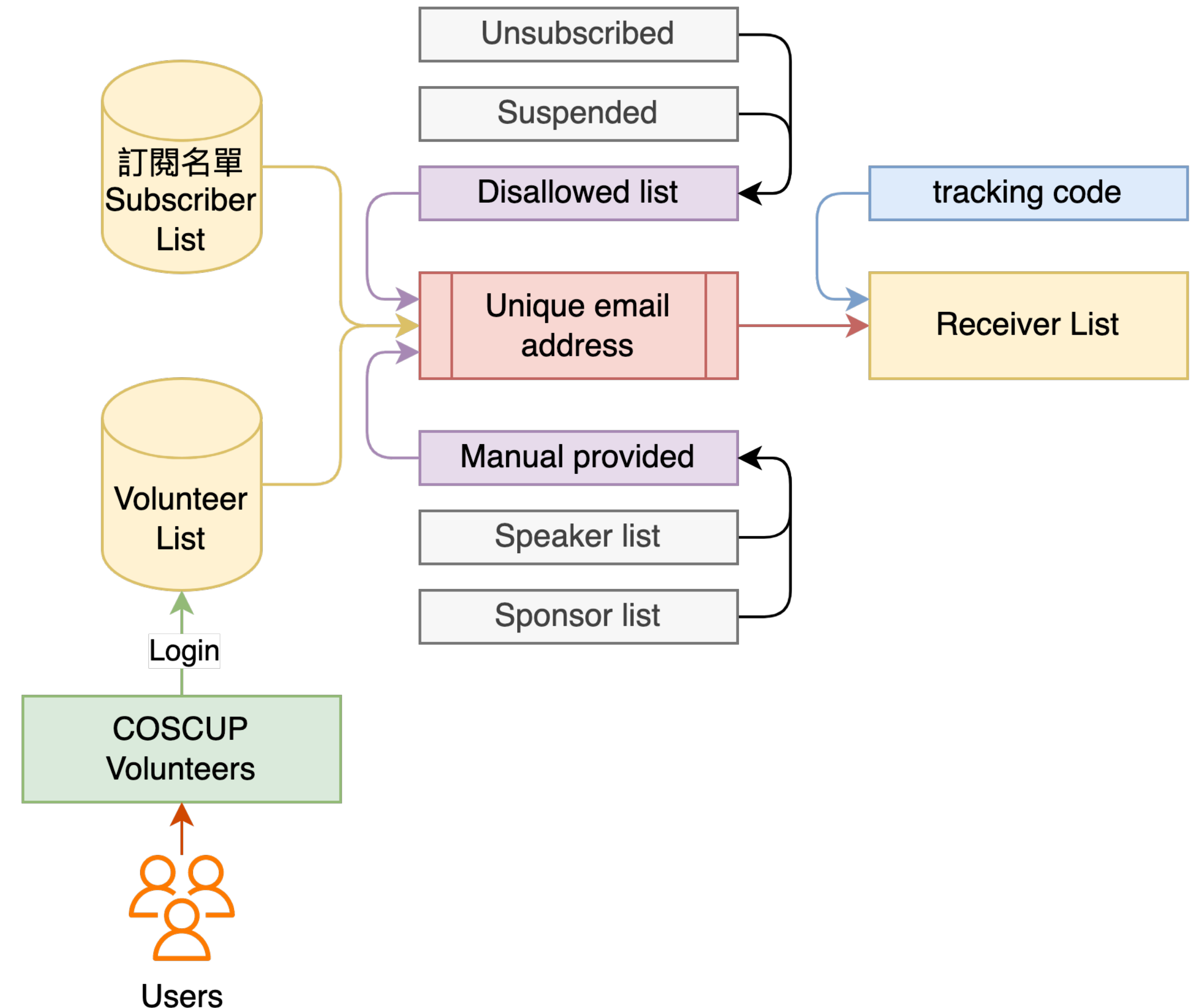
- Filter out the unsubscribed and suspended user account.
- Append the sponsors and speakers list of this or last year.



③ Combine List

Append the tracking code

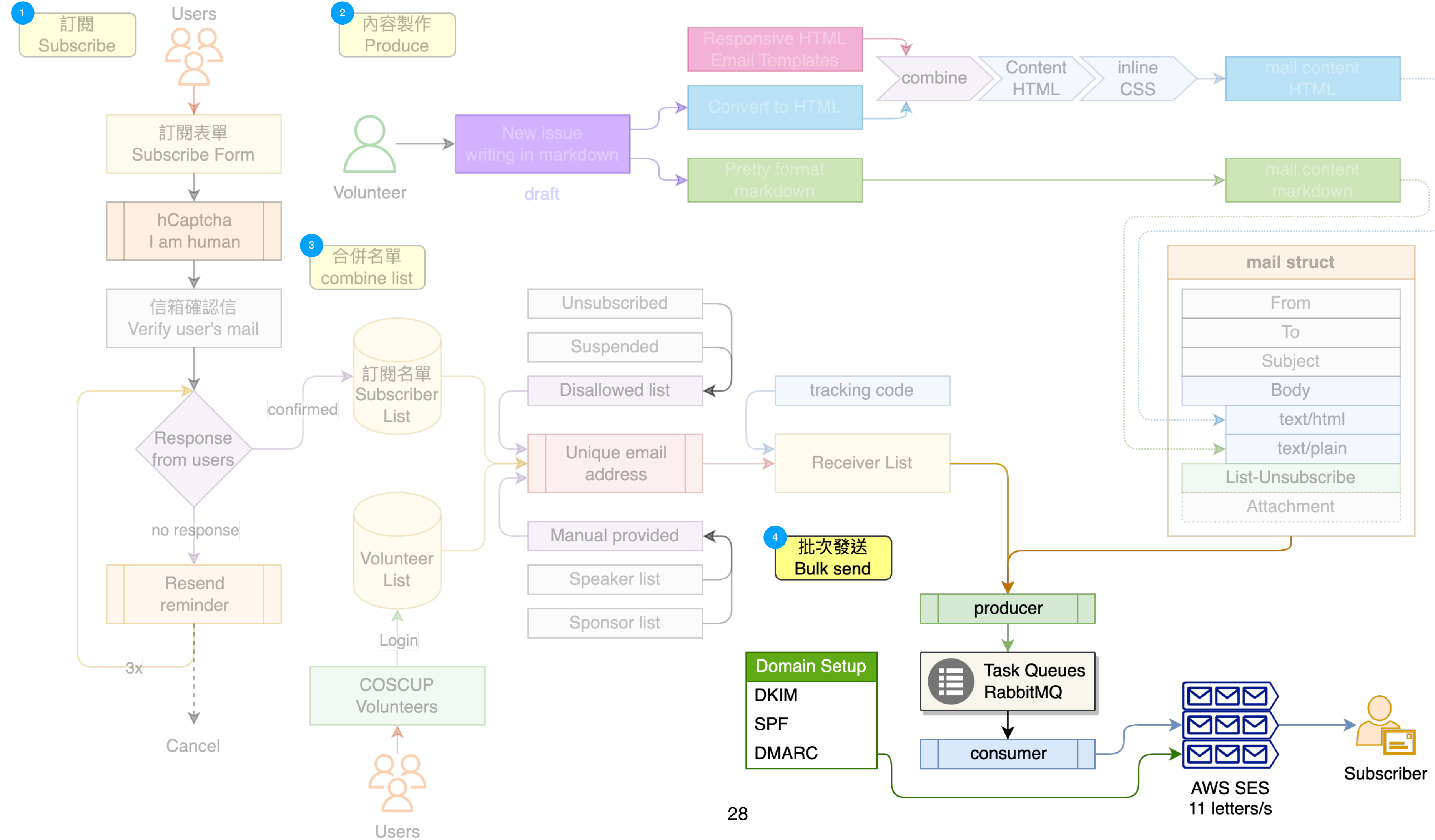
- The code for mail-open tracking.
- $\text{hash} = \text{sha256}(\{\text{secret}\}, \{\text{args}\})$
- $\text{url} = \{\text{domain}\}/\text{c}/\{\text{hash}\}?\{\text{args}\}$
- ``
 - Tips: The backend must return 404 http status code.
 - In this way, we could track the numbers of opened, not just opened or not.



④ Deliver / Bulk Send

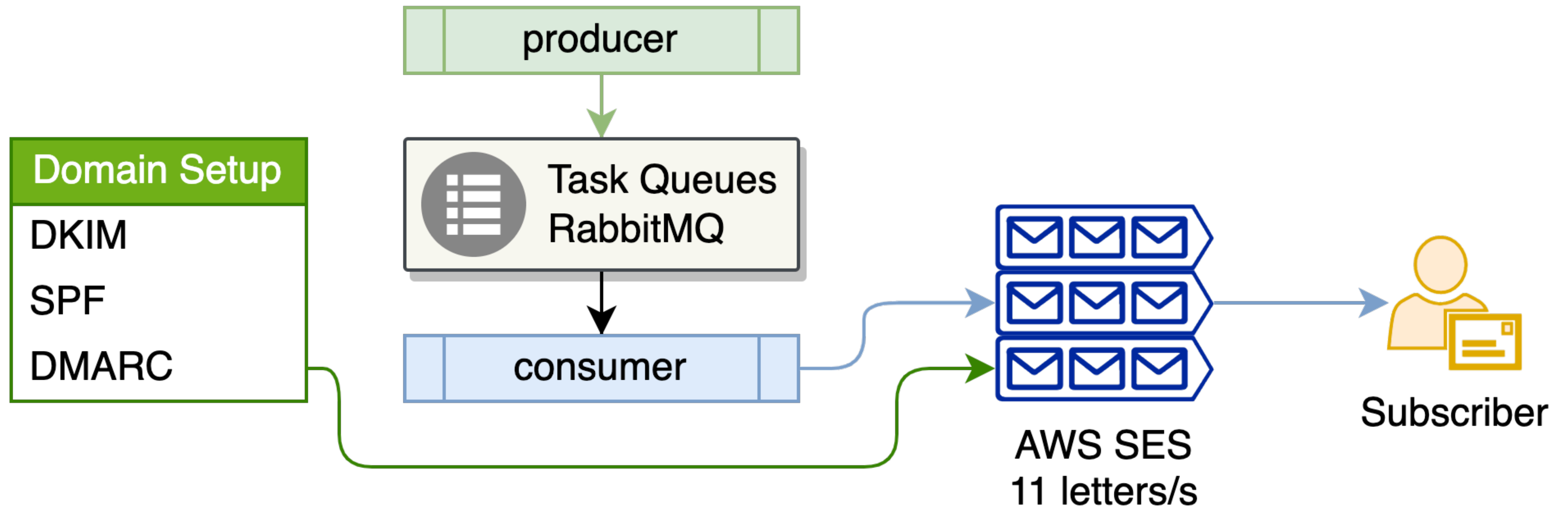
Workflow

Subscribe → Produce → Lists → Deliver*



④ Deliver / Bulk Send

What's SPF, DKIM, DMARC



④ Deliver / Bulk Send

What's SPF

- The Sender Policy Framework (SPF) record basically tells the world which **hosts** or **IPs** are allowed to send email for your domain.
- If not in the allowed list, the mail will to be as spam.
- "v=spf1 include:amazonses.com include:_spf.google.com **?all**" (more details.)
 - **-all**: Fails authentication. The server with matching IP address is not authorized to send for the domain. The SPF record doesn't include the sending server IP address or domain so **messages won't pass authentication**.
 - **~all**: Softfails authentication. It's unlikely that the server with matching IP address is authorized to send for the domain. The receiving server will typically **accept the message but mark it as suspicious**.
 - **?all**: Neutral. Neither passes nor fails authentication. The SPF record doesn't explicitly state that the IP address is authorized to send for the domain. SPF records with neutral results often use ?all.

④ Deliver / Bulk Send

What's DKIM

- Domain Keys Identified Mail (DKIM) is a method of email authentication that cryptographically verifies if an email was sent by trusted servers and has not been tampered with.
- Basically, when a server sends an email using your domain, it will calculate an encrypted hash of the email contents using a private key (that only trusted servers know) and add it to the email headers as a DKIM signature.
- The receiving server will verify the email contents by looking up the corresponding public key in your domain's DNS records, decrypting the encrypted hash, and calculating a new hash based on the email contents it received. It then compares the decrypted hash to the new hash. If there is a match, then the email has not been tampered with, and so DKIM passes. Otherwise, DKIM fails, and the email is treated with suspicion.

④ Deliver / Bulk Send

What's DKIM

- The receiving server will verify the email contents by looking up the corresponding public key in your domain's DNS records, decrypting the encrypted hash, and calculating a new hash based on the email contents it received. It then compares the decrypted hash to the new hash. If there is a match, then the email has not been tampered with, and so DKIM passes. Otherwise, DKIM fails, and the email is treated with suspicion.

```
DKIM-Signature: v=1; a=rsa-sha256; q=dns/txt; c=relaxed/simple; s=o6odsjgst6o5osk  
t=1684458597; h=Content-Type:MIME-Version:From:To:Subject:List-Unsubscribe:Message-Id:  
bh=N6EoZv+4CVQ3uG6XHT0egzd7nJlk4ykvbuFCzsr70dU=;  
b=RpsWYu6s9LpaMXAomY5c39ES1+d1xqdn7QoZLvgXB+0VyhCca9YRSpL6+DlfQ/nY  
n37Hk6CNcH6ko3F3PCMpJWqI2K1vVkeeGyNPoPY+vqvmLKU00rjX0TL0PyLhiE/LEFE vjMs1ya/3L5qr  
DKIM-Signature: v=1; a=rsa-sha256; q=dns/txt; c=relaxed/simple; s=224i4yxa5dv7c2o  
d=amazonses.com; t=1684458597; h=Content-Type:MIME-Version:From:To:Subject:List-  
ID:Date:Feedback-ID; bh=N6EoZv+4CVQ3uG6XHT0egzd7nJlk4ykvbuFCzsr70dU=;  
b=HVzMUJ5LJLpffEDFPw4EnW3PoIcxAZkpxwepTxcRjx5hsIdRy6zs8HzRTPaPTW0t  
ISHk07YcEkzbeQDkzn2u5VQcQilxcK0goUVduQ3s8tj6A4QCqvWbsJj/HU3+Kkpj9LQ 6tt0ijW0X0+Zf  
Content-Type: multipart/mixed; boundary="=====  
MIME-Version: 1.0  
From: "COSCUP Volunteer 志工服務" <volunteer@coscup.org>
```


④ Deliver / Bulk Send

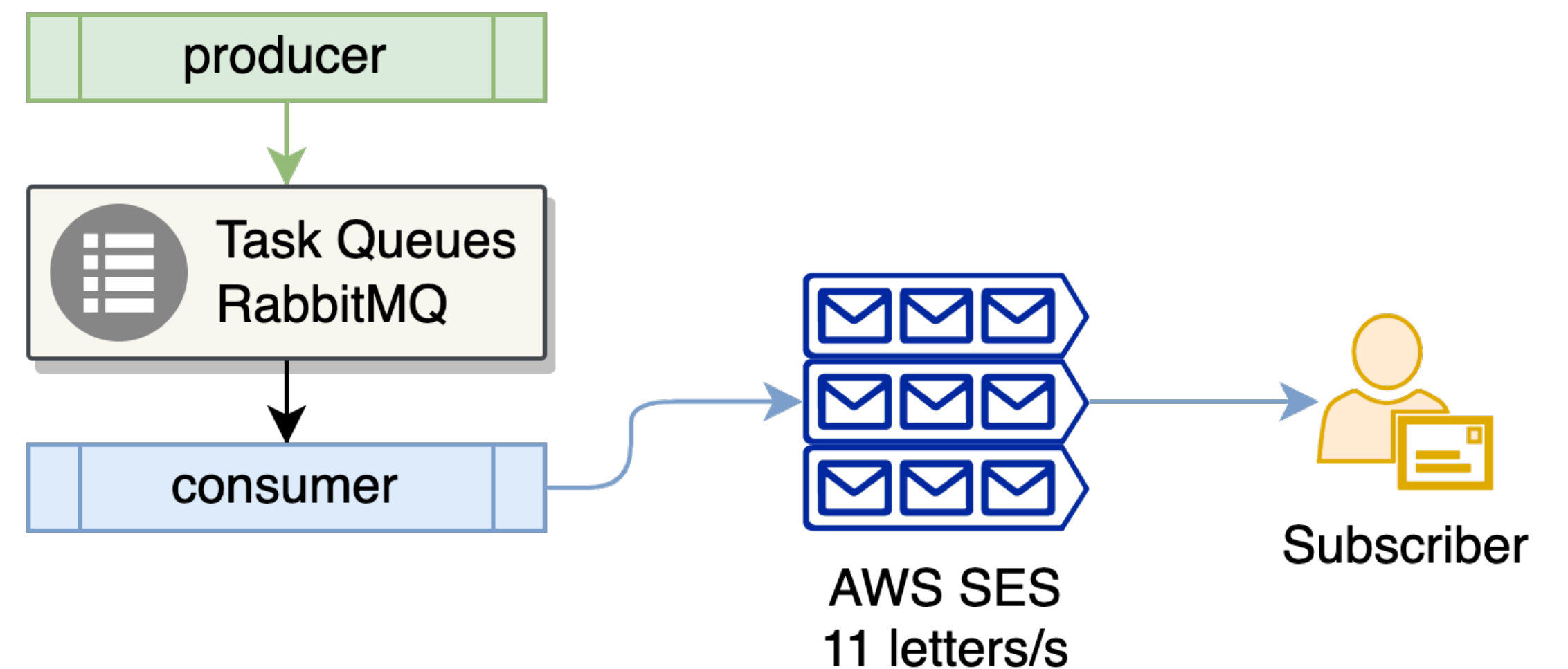
What's DMARC

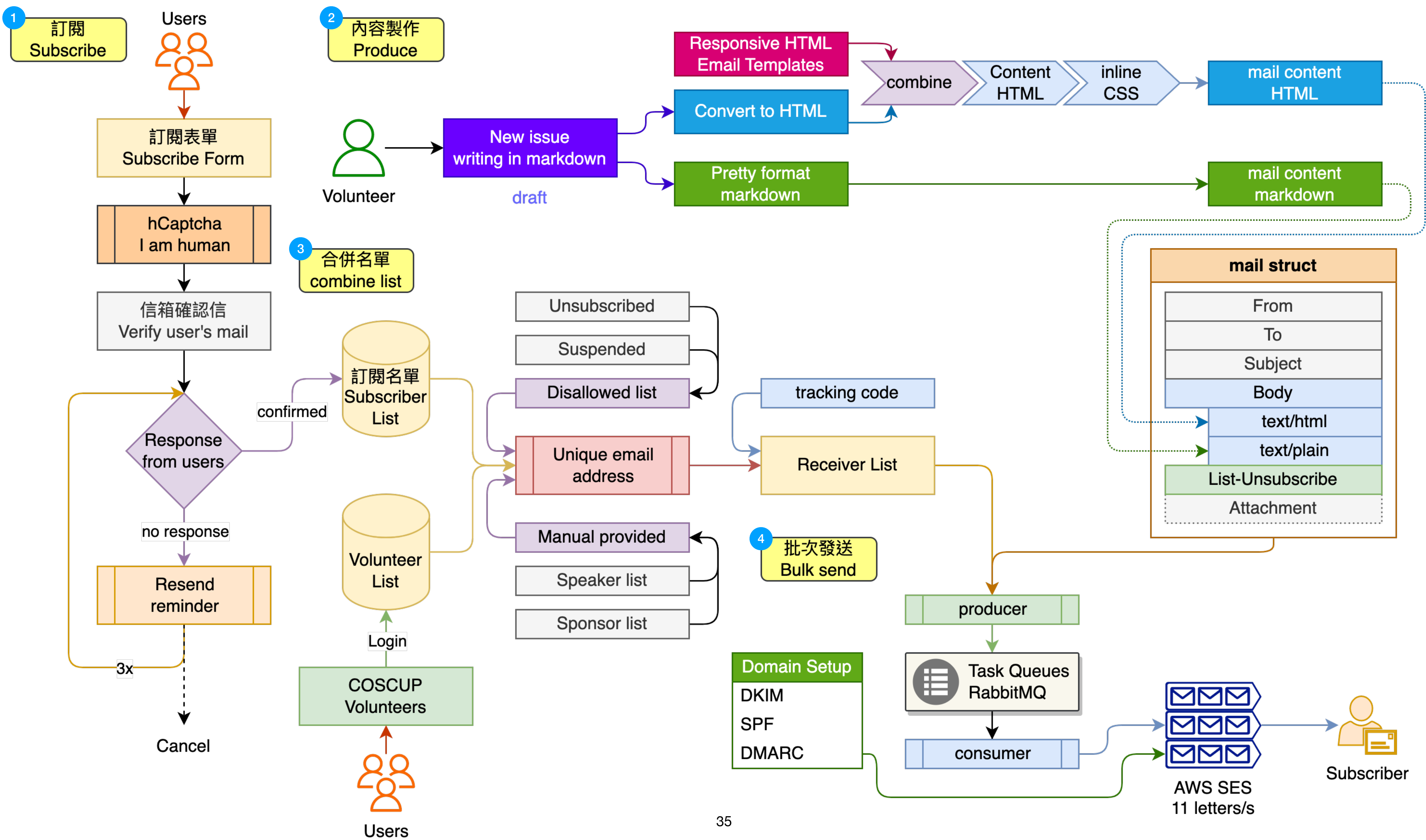
- How the receiving server deals with an email that fails the checks?
 - Domain-based Message Authentication, Reporting, and Conformance (DMARC) allows the **domain owner** to specify what happens with failed emails and get feedback when they arrive. Basically, there are three actions receiving servers can take if BOTH SPF and DKIM checks fail: **none**, **quarantine**, and **reject**.
 - This setting are more complicated, the more details could refer to: <https://support.google.com/a/answer/10032169>

④ Deliver / Bulk Send

Queue / RabbitMQ

- The bulk send still has limited, AWS SES 11 letters per second.
- Our codebase is Python:
Celery → RabbitMQ → AWS SES
- Launch more multi-workers to force the queue limit up to 11 letters/s.
 - Fail of limit, retry and back to queue.
 - 5000 mails => 7.57 mins





⑤ Tips and more

⑤ Tips and more

Why we still build the system or services?

- For the privacy, keep and maintain the users' list in safety.
- Compared or combined the data in consistent.
- And found the best or better way to do **open-source** things.

5 Tips and more

How to explain the numbers of opened?

- The large numbers of opened mail may open by many readers.
 - The mail has been forwarded.
 - The original user help us to share the mail to more users.
 - Friend → Friends
 - Community / Groups
 - Teacher → Students

151.	87562887	4
152.	4ae56f46	1
153.	76f08aaa	2
154.	5d57e284	13
155.	4157a5af	3
156.	af5b8f41	4
157.	ad8110ae	

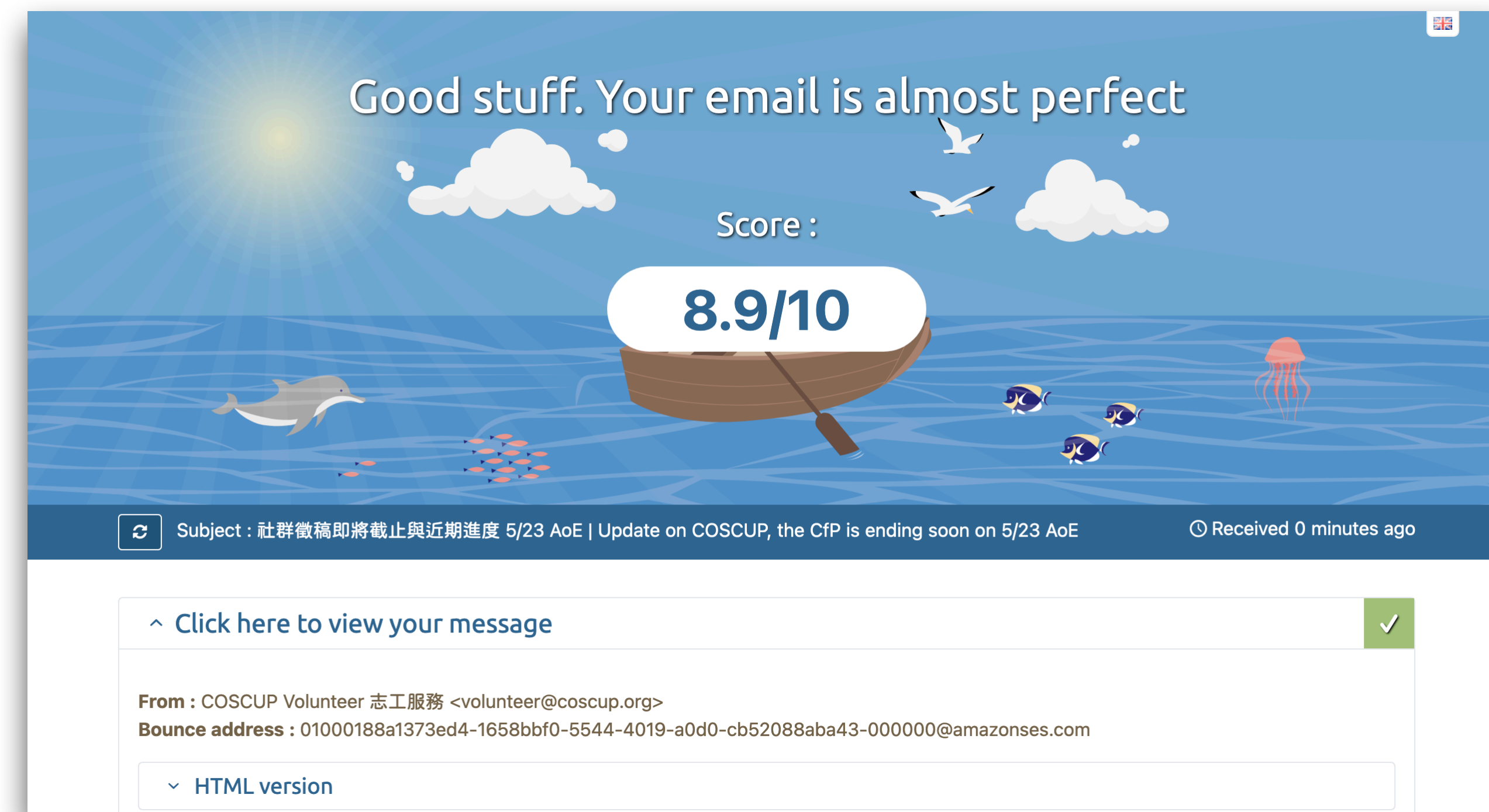
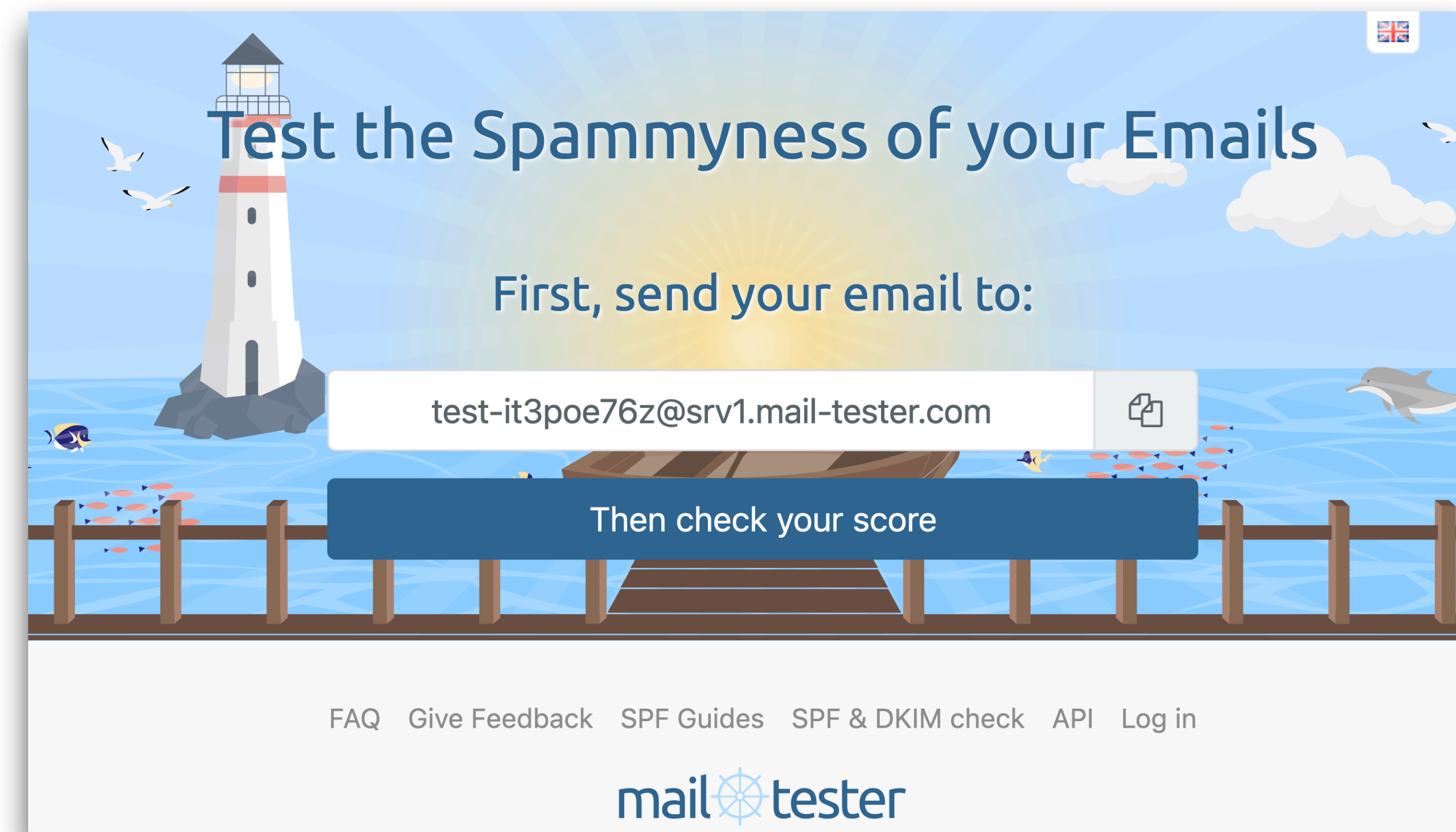
1204.	5/19/2023, 1:06:55 PM	5d57e284	220.130.197.246	Mozilla/5.0 (Ma AppleWebKit/6
1205.	5/19/2023, 1:06:53 PM	5d57e284	220.130.197.246	Mozilla/5.0 (Ma AppleWebKit/6

1457.	5/19/2023, 10:48:15 AM	5d57e284	172.226.160.2	Mozilla/5.0
1458.	5/19/2023, 10:48:09 AM	c32ed2f1	74.125.209.68	Mozilla/5.0 (Windows NT 5.1; rv:11.0) Gecko Firefox/11.0 (via ggph.com GoogleImageProxy)
1459.	5/19/2023, 10:47:23 AM	5d57e284	220.130.197.246	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/537.36 (KHTML, like Gecko) SparkDesktop/3.4.3 Chrome/110.0.5481.104 Electron/23.1.1 Safari/537.36
1460.	5/19/2023, 10:47:22 AM	5d57e284	220.130.197.246	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/537.36 (KHTML, like Gecko) SparkDesktop/3.4.3 Chrome/110.0.5481.104 Electron/23.1.1 Safari/537.36

5 Tips and more

How to test the mail to prevent being spams? (1/2)

- Check your sender setting or the mail content is more quality. Send the mail to the unique email provided by Mail-Tester.



5 Tips and more

How to test the mail to prevent being spams? (2/2)

^ SpamAssassin thinks you can improve

-0.1

The famous spam filter *SpamAssassin*. Score: -0.1.

A score below -5 is considered spam.

-0.1	DKIM_SIGNED	Message has a DKIM or DK signature, not necessarily valid This rule is automatically applied if your email contains a DKIM signature but other positive rules will also be added if your DKIM signature is valid. See immediately below.
0.1	DKIM_VALID	Message has at least one valid DKIM or DK signature Great! Your signature is valid
0.1	DKIM_VALID_AU	Message has a valid DKIM or DK signature from author's domain Great! Your signature is valid and it's coming from your domain name
0.1	DKIM_VALID_EF	Message has a valid DKIM or DK signature from envelope-from domain
-0.249	HEADER_FROM_DIFFERENT_DOMAINS	From and EnvelopeFrom 2nd level mail domains are different
-0.001	HTML_MESSAGE	HTML included in message No worry, that's expected if you send HTML emails

5 Tips and more

How to setup the unsubscribe link or by List-unsubscribe headers?

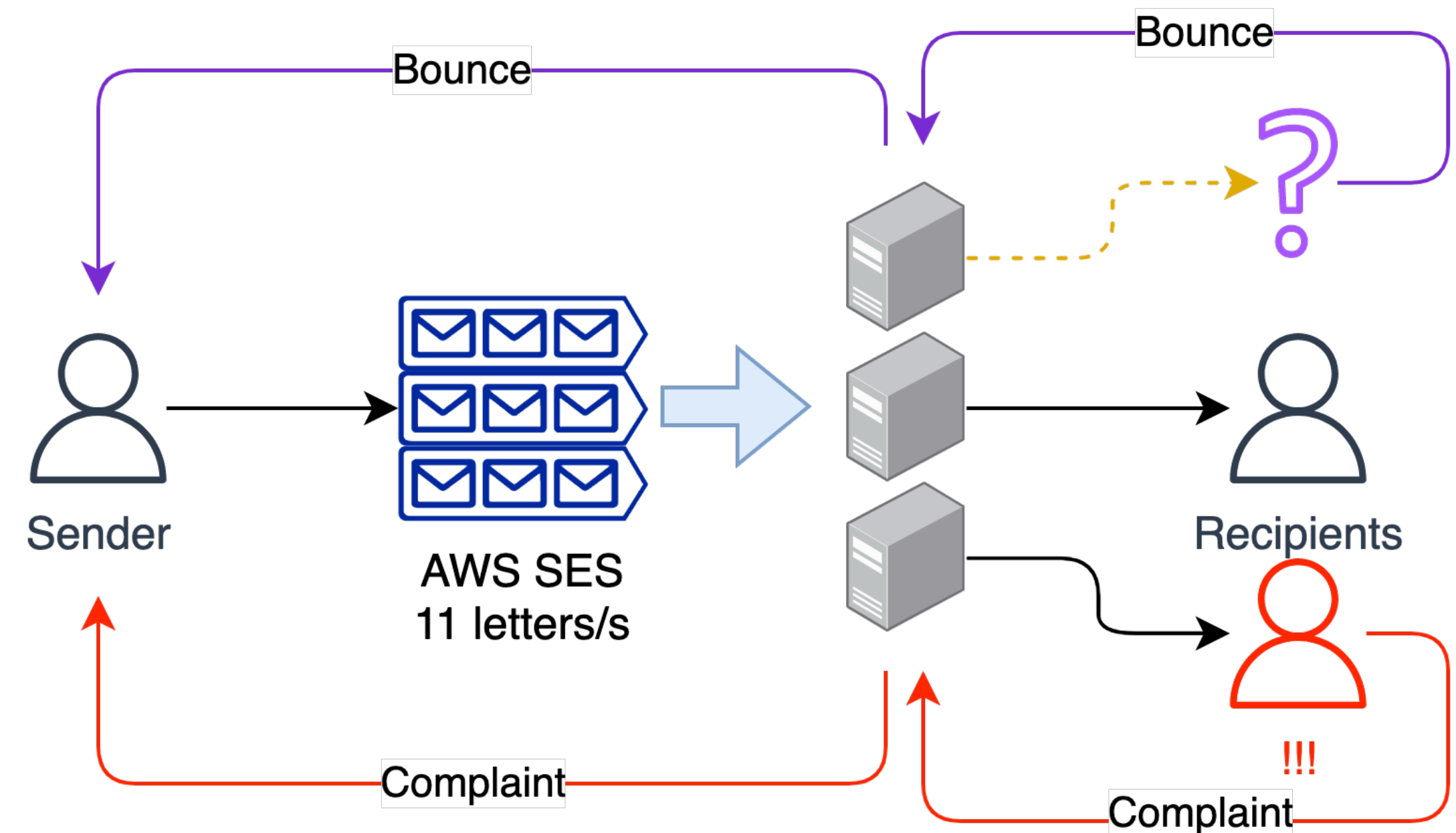
- Let's the subscriber has OPT-OUT to unsubscribe.
- Add the `List-unsubscribe` into the mail headers in `*<mailto:volunteer+unsubscribe@coscup.org>*`, the mail client has supported the processing for users.

```
from: COSCUP Volunteer 志工服務
<volunteer@coscup.org>
to: "toomore0929@gmail.com"
<toomore0929@gmail.com>
date: Jun 10, 2023, 1:32 AM
subject: 2023.05.19 社群徵稿即將截止與近期進度 | Update
on COSCUP, the CfP is ending soon on 5/23 AoE
mailed-by: amazonses.com
signed-by: coscup.org
unsubscribe: Unsubscribe from this sender
security:  Standard encryption (TLS) Learn more
>: Important mainly because it was sent directly to
you.
```

5 Tips and more

What is sending reputations?

- bounce rate / complaint rate
 - bounce: like account not existed or recipient's mail server permanently rejects the message.
 - complaint: recipient reports to their email provider that the message they received was unsolicited or unwanted.





Who am I ?

🧐 Who am I ?

- Toomore Chiang
- From Kaohsiung, Taiwan.
- First time participated COSCUP at 2008.
 - Leader of the secretary team (行政組)
- COSCUP 2023 → 07/29 - 07/30 Taipei.
- Open Culture Foundation 開放文化基金會 OCF.TW
Technical Support Lead.

