



Universal Acceptance of Social Media Platforms

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About Oxford Information Labs (OXIL)

Oxford Information Labs is a cyber intelligence consultancy specializing in Internet governance, policy development, and research. Supported by a highly innovative technical team, our work is informed by our own longitudinal studies, academic research, database design, data visualization, and development of Internet services that are 'secure by design'. We apply extensive industry knowledge to our consultancy services, working with government and major Internet players in regulatory, security, Domain Name System (DNS) and educational domains.



Introduction

This research provides an analysis of the Universal Acceptance (UA)-readiness of some of the most popular social media applications worldwide. Criteria for this study was set out by [ICANN](#) and the [UASG](#) and the findings of this study will be used for future recommendations to improve UA.

Executive Summary

Universal Acceptance (UA) is described by the Internet Corporation for Assigned Names and Numbers (ICANN) on their website as “the concept that all domain names and email addresses should be treated equally.”¹ The context surrounding UA is that, currently, not all domain names and email addresses are accessible for users on the Internet. This issue is at the heart of our research. As prior research on UA has shown, not all languages and scripts are treated equally by all Internet-enabled applications, and our tests and reports hope to shed further light on the extent to which diverse languages and new top-level domains (TLDs) are accepted by social media applications.

The introduction of Internationalized Domain Names (IDNs) as well as new and longer TLDs, allow users to access the Internet in their chosen online identities and using local languages and scripts. However, our findings show that social media applications still have a long way to go regarding UA-readiness and the equal treatment of both new and longer domains and email addresses.

There are billions of users who access social media applications around the globe. They typically enter a unique identifier to register with the platform, sign in, and then use the application to make posts that can include website address links and email addresses, or send private messages to other users. The unique identifier used to register and sign into a social media application has typically been in the form of an email address, but can also be a mobile phone number.

The objective of this project was to provide research and analysis on the UA-readiness of different social network platforms. This research will enable policymakers to better understand how the Internet is being impacted by the end users’ choice of TLDs and script.

The findings of this project will also contribute to identifying any information gaps in UA. Recommendations with input from the UASG community will be sent to the social network platforms.

Tests performed were based upon the Social Network Universal Acceptance Gap Analysis Testing Matrix,² with social network applications selected by the UASG to include the most popular social network platforms as well as those specific to particular locales. Tests were performed in Q3 of 2021 with the objective of evaluating the UA-readiness of the most popular social media applications. Results will be further explained in the Test Results section of this report.

¹ <https://www.icann.org/ua>

² Social Network UA Gap Analysis Testing Matrix, <https://community.icann.org/display/TUA/UA+Statements+of+Work> 18/02/201



Results Overview

Overall, the results of the social media application tests show poor Universal Acceptance for authentication using internationalized, non-ASCII email addresses without exception. No social media application was able to facilitate registration and therefore log in using an internationalized email address.

Conversely, once authenticated using a valid Latin-ASCII email address or telephone number, the vast majority of the networks tested showed strong UA-readiness when posting internationalized email addresses and IDNs using built-in posting and private messaging functions with accurate display of these items as pasted, and in many cases (as platform policy allowed), accurate conversion to clickable links.

Overview

No social media application passed the test of registering a non-ASCII, internationalized email address. This is shown in the first chart as 'Test Part 1' as being **RED**. The second part of the tests were around the posting and messaging of non-ASCII domain names, and testing whether the domain names behaved how the end user would expect (i.e., whether they came up as a hyperlink and connected to the correct URL). This received varying success and is displayed in the second chart in different shades of **GREEN**, with lighter green representing the highest success.

The second chart ranks each social network for each tested environment according to how well they succeeded at handling the posting of IDNs in messaging and public post environments. The ranking was derived from the comprehensive data set presented later in this document by summing each column for all applicable URLs using the formula from the original results (2 x green entries + 1 x orange entries).



However, the results of the second part of the test showed varying success in regard to displaying and behaving how an end user would expect when posting an IDN or internationalized email address in the social media application. The results in Chart 2 show that Telegram illustrated the most UA-readiness in this regard. LinkedIn, Facebook, and Twitter were second and third. Line, YouTube, VKontakte, WeChat, Odnoklassniki, WhatsApp, Sina Weibo, QQ Tencent, and Snapchat all fell behind in terms of UA-readiness with the tests performed outlined below.



6a	End user wants to post a message which includes a website address. She expects the website address is displayed correctly.				
6b	End user wants to post a message which includes a website address. She expects the website address is recognized as a hyperlink or link preview card.				
7a	End user wants to send a website address to another end user via private message or chat message. He expects the website address is displayed correctly.				
7b	End user wants to send a website address to another end user via private message or chat message. He expects the website address is recognized as a link via link preview or URL underlining.				
8	End user wants to enter his website address in his profile account. After saving his settings, he can see it and open it.				
9	End user clicks on a website address (link preview or underlined link) to open the website page.				
10	End user clicks a website address link and opens the built-in browser. He can observe the URL in the title or info bar.				

Methodology

The identified list of 12 social media applications (with support for all OS environments) for this study is as follows:

- Facebook
- Facebook Messenger
- Twitter
- Instagram
- WhatsApp
- YouTube
- TikTok
- WeChat
- Baidu Teiba
- Dou Yin (Tik Tok in Chinese)
- QQ (Tencent)
- Sina Weibo

As stipulated by the UASG, a simulation of access from the following regions was undertaken for each social media application to determine whether the behavior of the application varies according to the location of access.

- Worldwide
- China
- India
- Eastern Europe
- Thailand
- Middle East
- Africa
- Latin America

The following table (based upon the table supplied in the UASG statement of work) encodes in green the expected locations using each of the target networks for regional testing purposes.

Network	Worldwide	China	India	EE	Thailand	Latin America	Middle East	Africa
Facebook								
Facebook Messenger								
Twitter								



Instagram								
WhatsApp								
YouTube								
TikTok								
WeChat								
Baidu Teiba								
Dou Yin								
QQ								
Sina Weibo								
QZone								
Telegram								
Snapchat								
LinkedIn								
Vkontakte								
Odnoklassniki								
Line								

As this was fundamentally a test of the UA-readiness of social network software solutions, there was not a requirement to test multiple browsers or environments. But the scope of this study encompassed the four most popular operating systems for social media applications which were identified as Windows Desktop and Mac OS for desktop and iOS and Android for mobile devices. The table below details the operating systems with the identified test environments being used for this study.

OS	Test Environment
Windows 10	Chrome 91.0
Mac OS 11 (Big Sur)	Chrome 91.0
IOS 14.6	Native App where available
Android 11	Native App where available



Tests were based upon the Social Network Universal Acceptance Gap Analysis Testing Matrix,³ largely to reflect overall user experience and to replicate the process a user would take to register, log in, change email address, post, and message URLs.

After performing individual tests using a variety of email addresses that include internationalized email addresses in different scripts as well as ASCII email addresses, all the IDN email addresses could not be used to register and log in to any of the social media applications that enabled this option.

Test Cases

The following test cases have been identified as in scope for this project. Each test has been encoded by the UASG using the AT/VT/PIT/ST/P2T/DT step classification system as per the Universal Acceptance Readiness Framework ([UASG026](#)) for web-based applications.

Test cases 1-5 required the use of a source email address and these were executed against all email addresses identified in the section below. The remaining test cases (6-10) required the use of a URL and as such were executed against all domain names identified in the section below.

Test 1: Register new account		
Scenario: End user wants to create a new user account in the social network application. User uses their choice of email address.		
Applicability: Applications that allow using an email address to set up a new account for the application.		
Step #	Test Type	Description
1	AT	Visit registration page for social network
2	DT	Fill in new account details and proceed to register account

Test 2: Authenticate user account		
Scenario: During or after registration the application sends an email to the user's account. The user then needs to reply or click a link to verify the email address.		
Applicability: Applications that use an email address during the registration process (set up email address in profile account). The email system on the receiver end must be able to handle all types of email addresses. <i>Requires successful completion of Test 1.</i>		

³ Social Network UA Gap Analysis Testing Matrix,
<https://community.icann.org/display/TUA/UA+Statements+of+Work> 18/02/201



Step #	Test Type	Description
1	P2T	1. Log in to webmail, confirm that activation link/email has been received (use resend activation email if required).

Test 3: Log into application using email address

Scenario: Using the same email address the end user used to create the account, user now uses it to sign into the social network.

Applicability: Applications that allow using an email address to set up a new account for the application. *Requires successful completion of Test 2.*

Step #	Test Type	Description
1	AT	Log in to application using email address

Test 4: Share email address in a post

Scenario: End user wants to post a message that includes their email address. User expects the email address to be recognized as a hyperlink.

Applicability: Applications with a user feed/wall/board in which a free form text can be typed in. *Executed after logging in to the application as simple control account.*

Step #	Test Type	Description
1	AT	Paste email address into post and submit post
2	P1T	Confirm that email address is displayed correctly in newly created post (not corrupted)
3	DT	Confirm that the email address is presented as a link in the post

Test 5: Set up email address in profile account page

Scenario: End user wants to set up the email address of their choice on the profile account page.

Applicability: Applications that support an email address field in the user's account page. *Executed after logging in to the application as simple control account.*

Step #	Test Type	Description
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1	AT	Update email address in profile account
2	DT	Confirm email address has changed and displays correctly in profile account

Test 6: Share website address in a post

Scenario: End user wants to post a message which includes a website address. User expects the website address is recognized as a hyperlink or link preview card.

Applicability: Applications with a user feed/wall/board in which a free form text can be typed in. *Executed after logging in to the application as simple control account.*

Step #	Test Type	Description
1	AT	Paste URL into post and submit post
2	P1T	Confirm that URL is displayed correctly in newly created post (not corrupted)
3	DT	Confirm that the URL is presented as a link in the post

Test 7: Send URL via private message

Scenario: End user wants to send a website address to another end user via private message or chat message. User expects the website address to be recognized as a link via link preview or URL underlining.

Applicability: Applications with a peer-to-peer messaging feature. *Executed after logging in to the application as simple control account.*

Step #	Test Type	Description
1	AT	Paste URL into post and submit post
2	P1T	Confirm that URL is displayed correctly in newly created post (not corrupted)
3	DT	Confirm that the URL is presented as a link in the post

Test 8: Set up website address in profile account

Scenario: End user wants to enter their website address in their profile account. After saving their settings, user can see it and open it.



Applicability: Applications that support a website in the user's account page. *Executed after logging in to the application as simple control account.*

Step #	Test Type	Description
1	AT	Update website in profile account
2	DT	Confirm website has changed and displays correctly in profile account

Test 9: Open website address from a post or private message

Scenario: End user clicks on a website address (link preview or underlined link) to open the website page.

Applicability: Applications that allow sharing of website addresses in posts or private messages. *Requires successful completion of Test 7.*

Step #	Test Type	Description
1	VT	Click the link created in Test 7 and confirm that the correct web page is loaded in the browser.

Test 10: Display website address in built-in browser

Scenario: End user clicks a website address link and opens the built-in browser. User can observe the URL in the title or info bar.

Applicability: Applications that have built-in browsers to browser websites pages. *Requires successful completion of Test 7.*

Step #	Test Type	Description
1	VT	Click the link created in Test 7 and confirm that the correct web page is loaded in the built-in browser including URL and title showing correctly.

Test Email Addresses and Test Browsers

The full list of test email addresses along with their category and script are detailed in the table below.

	Category	Email Address	Script
1	ASCII.ASCII (new-short)	ua-test-21@universal-acceptance-test.icu	Short ASCII



2	ASCII.ASCII (new-long)	UA-test-21@universal-acceptance-test.international	Long ASCII
3	Unicode@IDN.IDN	ΥΑ-δοκιμές-21@καθολική-αποδοχή-δοκιμή.ευ	Greek
4	Unicode@IDN.IDN (RTL)	قبول عالمي-اختبار-٢١@تجربة-القبول-الشامل.موريتانيا	Arabic
5	Unicode@IDN.IDN	牛津-测试-二十一@普遍适用测试.我爱你	Simplified Chinese
6	Unicode@IDN.IDN	यूए-परीक्षा-21@सार्वभौमिक-स्वीकृति-परीक्षण.संगठन	Devanagari
7	Unicode@IDN.IDN	UA-тест-21@универсальное-принятие-тест.москва	Cyrillic
8	Unicode@IDN.IDN	UA-Prüfung-21@Universales-Akzeptanz-Test.vermögensberatung	Latin with Accents and Diacritics
9	Unicode@IDN.IDN (A-Label.U-Label)	牛津-测试-二十一@xn--tkvs6ms8gqpywye3ma.我爱你	Simplified Chinese
10	Unicode@IDN.IDN (A-Label.A-Label)	牛津-测试-二十一@xn--tkvs6ms8gqpywye3ma.xn--6qq986b3xl	Simplified Chinese
11	Unicode@IDN.IDN (RTL;A-Label.U-Label)	قبول عالمي-اختبار-٢١@تجربة-القبول-الشامل.xn--mgbah1a3hjkrd	Arabic
12	Unicode@IDN.IDN (RTL;A-Label.A-Label)	قبول عالمي-اختبار-٢١@xn-----ctdbabcfhu9c2b9l1acccr4c.xn--mgbah1a3hjkrd	Arabic
13	Unicode@IDN.IDN	δοκιμή-διεθνοποίησης-διεύθυνσης@καθολική-αποδοχή-δοκιμή.ευ	Greek (IDNA 2008 Terminal Sigma)
14	Unicode@IDN.IDN	testßstring-ß@Universales-Akzeptanz-Test.vermögensberatung	Latin (IDNA 2008 German Sharp S)
15	Unicode@IDN.IDN	牛津-测试-二十一@普遍适用测试。我爱你	Chinese (Open Dot)
16	ASCII@ASCII.IDN (RTL)	ua-test-21@universal-acceptance-test.ⲁⲓⲛ	ASCII + Hebrew (RTL)
17	ASCII@ASCII.IDN	ua-test-21@universal-acceptance-test.ไทย	ASCII + Thai
18	Unicode@IDN.ASCII	UA-Prüfung-21@épreuve-acceptation-universelle.org	Latin
19	Unicode@IDN.IDN	การทดสอบ-คเมน-21@ยูเอททดสอบ.ไทย	Thai



20	Unicode@IDN.IDN	ունիվերսալ-թեստ-21@համընդհանուր-ընկալում-թեստ.hայ	Armenian
21	Unicode@IDN.IDN	સાર્વત્રિક-સ્વીકૃતિ-પરીક્ષણ-21@સાર્વત્રિક-સ્વીકૃતિ-પરીક્ષણ.ભારી	Gujarati
22	Unicode@IDN.IDN	მიღების-ტესტი-21@უნივერსალური-თავსობადობისტესტი.გე	Georgian
23	Unicode@IDN.IDN	ການທົດສອບການຍອມຮັບ-21@ສາກົນ-ການຍອມຮັບ-ທົດສອບ.ລາວ	Lao
24	Unicode@IDN.ASCII	épreuve-acceptation-21@épreuve-acceptation-universelle.org	(Non-NFC normalization form)

The later tests were executed using a range of IDNs for posting content.

The full list of test domain names along with their category and script are detailed in the table below.

	Category	Domain Name	Script
1	ASCII.ASCII (new-long)	universal-acceptance-test.international	Long ASCII
2	ASCII.ASCII (new-short)	universal-acceptance-test.icu	Short ASCII
3	IDN.IDN (RTL)	تجربة-القبول-الشامل.موريتانيا	Arabic
4	IDN.IDN	универсальное-принятие-тест.москва	Cyrillic
5	IDN.IDN	सार्वभौमिक-स्वीकृति-परीक्षण.संगठन	Devanagari
6	IDN.IDN	Universales-Akzeptanz-Test.vermögensberatung	Latin
7	IDN.IDN	普遍适用测试.我爱你	Simplified Chinese
8	IDN.ASCII (RTL)	com.موريتانيا-تجربة-القبول-الشامل	Thaana
9	IDN.IDN (RTL; U-label.A-label)	xn--mgbah1a3hjkrd.تجربة-القبول-الشامل	Arabic



10	IDN.IDN (RTL; A-label.A-label)	xn-----ctdbabcfhu9c2b9l1accr4c.xn--mgbah1a3hkrd	Arabic
11	ASCII.ASCII/Unicode	universal-acceptance-test.icu/测试	Chinese
12	IDN.IDN	ສາກົນ-ການຂອມຮັບ-ທົດລອງ.ລາວ	Lao
13	IDN.IDN	համընդհանուր-ընկալում-թեստ.hայ	Armenian
14	IDN.IDN	უნივერსალური-თავსობადობის-ტესტი.გე	Georgian
15	IDN.IDN	સાર્વત્રિક-સ્વીકૃતિ-પરીક્ષણ.ભારત	Gujarati
16	IDN.IDN	どこでもつかえる.みんな	Japanese
17	IDN.ASCII	épreuve- acceptation-universelle.org	non-NFC normalisation form
18	IDN.IDN	普遍适用测试。我爱你	Chinese Open Dot
19	IDN.IDN	ยูเอทศอบ.ไทย	Thai

Test Results

The following tables show a summary of the results of the social media application tests using each testing environment and operating system.

Caveats

With this being our main finding from the tests performed, it was assessed that there were several caveats to this study.

1. Line, Odnoklassniki, VKontakte, Telegram, Snapchat, WeChat, Sina Weibo, and WhatsApp required phone numbers as the unique identifier. This means that only 6 out of 15 chosen social media applications tested allowed an option for an internationalized email to register and log in to the platform.
2. YouTube only supports Gmail addresses on their platform which meant it could not be tested.
3. Certain social media applications could only be accessed in certain regions, such as ones that could only be accessed in mainland China, which made testing conditions more complex such as Dou Yin, Qzone, and Baidu Teiba.

The metadata and each individual result following the 10 tests is attached to this document.



The below tables show the results of the tests performed with green (Y) representing a pass on all tests, orange representing a failure of 2 or less tests, and red representing a failure of 3 or more tests.



Key Findings

Here are the key findings based on the detailed results gathered and summarized above for the set of social media applications identified for testing across the four test environments.

1. The only successful email address-based registrations for any of the identified social media applications with support for email address sign-ups (and subsequent validation and login, Tests 1 – 3) were for ASCII-only email addresses. In every case, all internationalized email addresses were rejected usually via a form validation error at the first stage of registration.
2. There was generally very good support for the display of internationalized email addresses and domain names in public posts and private messages (Tests 4a, 6a, 7a) across all social media applications and tested environments with almost complete parity with ASCII data items in each case. There was no observed variance in support for both right-to-left (RTL) scripts and special character example (Chinese Open Dot) which were similarly very well supported.
3. The manifestation as clickable links of included internationalized email addresses and domain names in public posts and private messages was much more variable by tested network (Tests 4b, 6b, 7b). In some instances (e.g., Instagram), the network adopted policy is to disable all links and simply display the domain name as plain text. There was also some variation in some of the regional networks (e.g., Odnoklassniki) in regard to which scripts were converted to clickable links, favoring regional scripts. There was very little variation in support for RTL scripts amongst those networks which correctly converted other left-to-right (LTR) script examples. However, most of the networks struggled to convert the special character (Chinese Open Dot) into a clickable link.
4. When comparing results across the different platforms it was clear that the majority of the providers have invested heavily in apps for mobile devices. For some of the providers, where there is support for private messaging only (e.g., Snapchat, Wechat), there was no support or very limited support for browser-based access. It is clear from the results that where a mobile app has been provided, the support for posting of internationalized content is generally very good. It was observed that Android performed slightly better than iOS overall, and in particular, provided full clickable link support for the special character example (Chinese Open Dot) in a number of cases. It is unclear whether the failure of iOS to support this correctly is an OS specific issue as it was handled correctly for YouTube.
5. When comparing region specific applications (e.g., V Kontakte, WeChat, Sina Weibo, Line) against worldwide networks (e.g., Facebook, Twitter, YouTube) it was generally observed that there was more consistent support amongst the regional networks. This was strongly evidenced in the mobile apps and there was generally a higher prevalence of reliable full link presentation for regional networks.



Regional Comparison Study

After contacting experts in each region around the locale testing environment to implement, we found that local and regional settings did not make any difference to the final result.

Network	China		India		EE		Thailand		Latin America		Middle East		Africa	
	International	Regional	International	Regional	International	Regional	International	Regional	International	Regional	International	Regional	International	Regional
Facebook			1, 2, 3, 4b, 5, 6a	1, 2, 3, 4b, 5, 6a			1, 2, 3, 4b, 5, 6a	1, 2, 3, 4b, 5, 6a	1, 2, 3, 4a, 4b, 5, 9	1, 2, 3, 4a, 4b, 5, 10	1, 2, 3, 4b, 5, 6a			
Twitter			1, 2, 3, 4b, 5, 8	1, 2, 3, 4b, 5, 9										
Instagram			1, 2, 3, 5, 7b, 8, 9	1, 2, 3, 5, 7b, 8, 10										
WhatsApp			6a, 6b, 7b, 8, 9	6a, 6b, 7b, 8, 10										
Youtube			1, 2, 3, 4b, 5, 7b, 8, 9	1, 2, 3, 4b, 5, 7b, 8, 10										
TikTok			1, 2, 3, 4, 5, 6b, 7b, 8, 9	1, 2, 3, 4, 5, 6b, 7b, 8, 9										
Wechat	NO DESKTOP	NO DESKTOP												
QQ	NO BROWSER VERSION	NO BROWSER VERSION												
Sina Weibo	4b, 5, 6b, 7b, 8, 9	1, 2, 3, 4b, 5, 6b, 7b, 8, 9												
QZone														
Telegram			6a, 6b, 7b, 8, 9	6a, 6b, 7b, 8, 10	6a, 6b, 8	6a, 6b, 9								
Snapchat			NO DESKTOP	NO DESKTOP										
LinkedIn			3, 3, 5, 7a, 8	1, 2, 3, 4, 5, 7a, 8										
Vkontakte					5	5								
Odnoklassniki					4b, 5, 8	4b, 5, 9								
Line							NO DESKTOP	NO DESKTOP						

Conclusion and Recommendations

In reference to the key findings of this study, it is clear that the two distinct activities of registration/authentication and content posting within social media applications produce very different outcomes in regard to UA-readiness.

For registration and authentication, our findings show very poor support when using non-ASCII, internationalized email addresses. There is currently very poor support for the sending and routing of internationalized email addresses by popular mail clients and relaying servers. It is our view that this lack of support may provide some explanation and context to the decision of social media vendors to either block internationalized email addresses at the point of registration or opt to use a telephone number-based authentication system which essentially sidesteps this issue. Although progress is slow in this area with big players still failing to support reliable routing of internationalized email addresses, there is growing robust support being provided in particular by the large cloud-based webmail providers. As this support grows, we hope that the social media vendors will eventually be able to relax their policies without a concern for escalating support issues and cost.

In contrast, our findings have shown generally very good support for the posting of both internationalized email addresses and IDN-based URLs using built in public posting and private messaging channels including RTL scripts. This is perhaps unsurprising due to the very high level of support for Unicode provided by modern browsers and mobile devices as well as server-side programming languages used to engineer these platforms. Unlike the potential issues with email routing, providing good support for internationalization presents no cost-based risk to the network operator. While some networks have adopted a policy of not converting email addresses and URLs to clickable links, this generally creates a minor inconvenience to users but does not materially affect the strong adherence to Universal Acceptance. Future improvements and enhancements in this area for some social media applications might include the avoidance of displayed Punycode conversions visible in some circumstances, and additional work to support some of the language edge cases such as the Chinese Open Dot which suffers from lack of support at the device level as well as in software.