
ICANN85 Mumbai | CF – ccNSO: Tech Day & UAC (2 of 4)
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CLAUDIA RUIZ

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And with that, I will now hand the floor over to Abdalmonem Galila, Chair of the Universal Acceptance Working Group. Thank you.

ABDALMONEM GALILA

Yes, thank you very much, Claudia. This is Abdalmonem Galila. Sorry. Good morning, good afternoon, good evening. This is Abdalmonem Galila for the record. I will share the session for today on behalf of Universal Acceptance Committee that was established since 2023 that has the goal to provide the ccTLD community a platform to interact and share information regarding to IDNs and AIs at the global level and with other work groups within the ICANN umbrella.

By the way, Universal Acceptance Committee have many scope of work. One of them is related to information sharing. The other one is related to liaison with other work groups, but for today, we are considering universal acceptance readiness, where all domain names and email addresses are all accepted, validated, stored, processed, and displayed correctly by all Internet application devices and the systems. These are these verbs called five verbs of universal acceptance readiness.

Mr. Sameer Gahlot from .in, ccTLD, will give us some information about .in, enabling multilingual internet and the policies related to .in registration and the variant code and open the floor for him for giving us this information in addition to how .in goes for universal acceptance adoption. Mr. Sameer, the floor is yours.

SAMEER GAHLOT

Thank you. Thank you. Thank you, Abdalmonem. And first of all, I would like to thank the ccNSO Tech Committee for reaching out and for giving us this option to present the scenario in the case of .in. As well as I would like to thank National Internet Exchange of India and Ministry of Electronics and IT for nominating me.

First of all, welcome to Mumbai, as we had an amazing opening ceremony in the morning. Beginning with this, may I have my PPTs on the screen? Yeah. Any idea, like, I will start with the basic interaction. How many languages are there in India which are officially recognized? Any idea, anyone? Okay.

ABDALMONEM GALILA

I think for India more than 100. Yeah, for India I think it's more than 100. Sorry, I think for India it is more than 100, maybe 120, and this represents I think 7% or 8% from all the language in Asia Pacific.

SAMEER GAHLOT

Yeah, I will take the lead from Tripti's opening remarks. So, in India the water changes every mile and the language changes every four mile. Although the officially recognized languages as per the Indian constitutions, there are 22 under the eighth schedule of the Indian Constitution. But the languages which we usually spoke are more than like in different dialects, it exceeds more than 2000. So, can we have the next?

CLAUDIA RUIZ

Sameer, if you get the remote, you can control them yourself. Thank you.

SAMEER GAHLOT

Sure, sure. Thank you, thank you. So, in this presentation we will be talking about how many officially recognized languages we have. We have 22 officially recognized languages under the eighth schedule of the Indian Constitution. If anyone would like to search more about how the different languages were adopted, they could definitely read the eighth schedule of the Indian Constitution. And the number of languages families it's four, Indo-Aryan, Dravidian, Tibeto-Burman, and Munda. And within these families we have two major scripts.

One is the Brahmi, left to right, and the Perso-Arabic, right to left. And these 22 officially recognized languages, 19 of them use 11 derivations of the Brahmi script, which means left to right. And the three languages, Urdu, Sindhi, and Kashmiri use Perso-Arabic, means right to left. So, this is the overall multilingual diversity in India and this is something which is there in the constitution. On ground, this like keep on evolving as the internet is evolving.

Now moving forward, NIXI provides, as mentioned in the morning also, NIXI provides internationalized domain names in 22 official languages across 11 scripts and 15 TLDs. And currently we have more than 1 million internet users in India.

When we had the previous meetings in India for the ICANN, ICANN31 and ICANN57, this ratio was very less. Like initially, when we had the meeting in 2008, 1 billion was the total number of the internet users globally. And what we see today, it's 1 billion in India only. So, you could see the impact and the number of people who are coming on board.

And much more needs to be done and we are working in that direction. So, for that, we have launched BhashaNet portal. So BhashaNet portal, it's a joint program launched by the Ministry of Electronics and National Internet Exchange of India for promoting multilingual internet in India.

So usually, we faced these issues wherein we were unable to or we don't know what are the tools which are required and how to test them and everything related to the technical part. So, this BhashaNet portal provides resources to the developers.

Basically, it provides standard operating procedures wherein any developer could use these platforms and make them, ensure that their websites are IDN ready and if there are any errors then they can definitely go through the SOPs. So, this portal provides resources for developers, enabling local language websites names, making internet more inclusive and accessible.

And India, or you could say that NIXI, is also promoting multiple initiatives, which aims to create digital identity for the villages. So, we have currently more than 6.5 lakh villages in India. And the objective, the vision with which NIXI is working, is to make sure that

the internet reaches to everyone, be it in the village or be it in the city or be it anywhere in any part of India.

So, for that we have this initiative wherein we are providing digital identities to the villages. And to promote the competition considering like India has one of the youngest population, we usually had these marathons or you could say that hackathons wherein we are providing opportunities to the young people to develop something under a regulated environment and then see whether that would work going forward considering our overall geographic.

Now, Indian languages, like I mentioned previously, the objective with which NIXI is working is to make sure that each and every person should be connected to the internet and there is this study which was conducted in 2023. It's an old study, I know, but multiple other studies are currently under process, so I refer this study so that people are aware about the one which is published.

Which says 45% of the rural population lacked internet access and if we connect the point in the previous slide with the one in the current slide, you will see, BhashaNet portal and the initiative wherein we are providing digital identity to villages combines with this one.

Now, how many IDNs we have, you could say, that are registered or provided, it's 0.3 million IDNs in 15 TLDs. And the overall objective with which we are currently functioning is developing multilingual online educational resources. As previously mentioned, we have a

very vibrant and young population, so these initiatives are focused on that part.

Now moving on to the further slides, these are the IDNs which are there on our website. So, the website is www.registry.in and you could easily develop the policy under which we are functioning. I will also share the QR code in the upcoming slides.

So, these are 15 TLDs. Yeah, so this is the white paper which we have worked in collaboration with the C-DAC team and the Ministry of Electronics after discussing with the linguistic experts and the policy makers. So the paper provides safeguards for ID and implementation. You could easily access the paper by scanning the QR code visible on the screen. Or maybe even the PPT will be available, you could access this.

So, now coming on the technical point, fundamental blocks of the IDNs, these are code point repertoires. The set of the characters which are like permitted for use in the script or languages. So, these are the fundamental blocks. And if you see the example, it's written in Hindi, it's Kitaab.

So, there are multiple variants as to how the word Kitaab is usually written. For your information, Kitaab means book. So, this is how the one which is written in the second and the third are not right, but the one which is written in the first is the right one. So, these are the code point repertoire which we have developed and mentioned. These are the permissible one.

Now coming on the second one, whole label evaluation rules. So, NIXI has contributed to these rules and these rules apply to evaluate the entire domain label to ensure the valid and secure combination of the characters like ki-taa-b, the entire complete sentence.

And when we talk about the code point, it's the valid sentences which are permissible for the IDNs. And the variants, we will also discuss about the examples in the upcoming slides so I will skip this for like another one minute or two.

So, these are the variants and there are certain confusing words due to the pure visual similarities. If you will see ka, gha and these are the words which are written in Hindi so probably you may not be able to understand, but these are some of the confusing domains or you could say the confusing words due to the pure visual similarity.

And this is the Group 1 and in the second slide this is the Group 2, so these are confusing due to the deviation from normal perceived characters formations by large linguistic communities. So, these are the two you could say that groups.

Now coming on the last and the most important slide, so NIXI or you could say that the ministry, they are usually promoting the multilingual internet in India, which is visible that India was the first country wherein the UA day was celebrated in 2023. And what we did during that time is we provided domain names, email

addresses, and the website in native languages and tried to bridge the gap.

So, in 2023, we were analyzing the situation as well as working towards mitigating the digital divide. In 2024, we developed the BhashaNet portal wherein we are providing the developers the chance to test their websites or you could say that get the tools which are necessary for creating the IDN or the multilingual environment. And this portal is live. Anyone could access this portal.

And in 2025, in the opening ceremony, you must have heard about the Viksit Bharat. So, the Viksit Bharat, it's the developed India, we are aiming a developed India by 2047. And in 2025, Universal Acceptance Day, we focused on connecting the unconnected while building a multilingual internet for the Viksit Bharat. And this is something which is currently going on and we are focusing on making it more better and better day by day.

But considering our population, work needs to be done and we are doing it at the same time, but the challenges are evolving and we are addressing these challenges. So, with that, I would like to thank the chair and my other colleague for giving me this opportunity. Over to the chair.

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- ABDALMONEM GALILA Thank you, Sameer. We could have some questions from the participants here or from the remote participation. Okay. Michael, go ahead, please.
- MICHAEL BAULAND Yes, thanks. Interesting and great presentation. One question about the variants, do you have allocatable variants? Can users activate variants or are those just blocked variants?
- SAMEER GAHLOT So, users could usually activate the variants and there are certain keywords which are blocked so that is something which keeps on changing with the jurisdictions.
- MICHAEL BAULAND Is there a restriction on the number of variants they can activate for a single domain name or could they activate like 10, 20, 100 variants?
- SAMEER GAHLOT No there are certain restrictions on that.
- ABDALMONEM GALILA Yeah, as a follow-up for the question for Michael, I would like to ask Mr. Sameer about what percentage of the issues that are related to homograph attacks, did you receive for .in domain names?

SAMEER GAHLOT Currently, I may not be aware about the percentage, but I will get back to you on that.

ABDALMONEM GALILA Okay, thank you. Any other questions? Yeah, go ahead, please.

CALVIN BROWNE Calvin Browne here. I'm curious, the ID and TLDs, do you allow ASCII and registrations in those or are they restricted to IDNs?

SAMEER GAHLOT Could you like ask your question once again? I'm unable to --

CALVIN BROWNE Sure. You said something that you had 15 IDNs, TLDs. Do you allow ASCII registrations in them or do you restrict them to IDN, .idn registrations?

SAMEER GAHLOT So IDN registrations.

CALVIN BROWNE Just IDN registration, no ASCII?

SAMEER GAHLOT

Yeah.

CALVIN BROWNE

Okay, great, thanks.

ABDALMONEM GALILA

Yeah, actually, you don't have any issues related to right to left or left to right, as all the script are all left to right. I think we don't have any problem for mixing both of them. Yeah, which is good for them in order to have something like this.

At the time, for example, for the IDN of Egypt, we couldn't combine Arabic with other words in English with different level how code is application or the system reads the domain name, it will be read from left to right or right to left, that will be a big issue for Arabic language. Yeah, thank you. Go ahead, please. Just state your name please.

TARUNA KAUR BAMRAH

Taruna Kaur Bamrah, NextGen for the record. So, I'm presenting about the AI divide, bridging digital inequality through inclusive internet governance and I'm talking about .bharat in Gurmukhi IDN. So what I wanted to know that NIXI enabled Punjabi .bharat in Gurmukhi script back in 2015 to bridge the linguistic divides. So how is NIXI measuring and addressing the residual UA failures in maybe rural Punjab resolvers or apps that still reject the Punai code worsening AI exclusion for the unconnected ones?

SAMEER GAHLOT

So, I was discussing this issue with like some of the delegates who are here for the ICANN. So, having this multilingual Internet, it's a behavioral change. Currently, we have all the resources, we have all the tools, we have all the technical capabilities, but working in that direction requires a behavioral change from ecosystem players.

And the government or you could say that NIXI, we are working on reducing the gap between the different ecosystem players and we are trying to create or you could say that doing this with the awareness and the capacity building programs, making the people aware about that this is the concept which exists.

Because resources and the tools are available, but you try to analyze this question from your own self, how many people are aware about universal acceptance in different areas of the world? But the developers, community and the other players, they are constantly working on making them aware.

ABDALMONEM GALILA

Yeah. Thank you very much. From .in to other journey from .rf or .ru, Mr. Vadim Mikhaylov, the information consulting engineer for .ru and .rf, will give us some information about the top-level domain name .ru and .rf. And also, what about the researches, and what about some statistics about the registrations, and other issues related to .ru and .rf. And what are the projects and services

to support EAI and universal acceptance? Mr. Vadim, the floor is yours.

VADIM MIKHAYLOV

Thank you. Thank you very much, Abdalmonem, for the presentation and introduction for me. I see my slides there, so hello everyone, my name is Vadim Mikhaylov. I provide infrastructure consulting for Russian National Domain Zone, .ru, and IDN domain .rf. Today I would like to tell you about our efforts in IDN and EAI, Email Address Internationalization II, implementation, about research, technologies, services we apply to .ru and .rf domains, as well as share future plans in this area. To set the context, I would like to briefly present you our domain zone structure.

We use the classic triple R registration model. The registry accredits registrars who then provide registration service for registrants. We work with part providers for backend and DNS series, the technical center of internet is our registry backend provider, while MSK-IX, the Russian internet exchange serve as our DNS provider. In addition, MSK-IX provides for us data escrow, ICANN accredited by the way, and local Iberia service, emergency backend registry operator. But it's local, we can't use ICANN accredited Iberia due to legitimate data privacy concerns.

We manage two top level domains. The Latin script .ru and Cyrillic one, .IDN .ref. In .ru, the Latin alphabets, digits and hyphens are available for registration in .rf, digits hyphen Russian alphabets,

and Cyrillic characters of the official state languages spoken by the ethnic groups within Russian Federation. This character support initiative was launched last year to mark the 15th anniversary of the .rf domain.

And last but not least, a number of the most reputable security expert organizations in the Russian Federation provide for our domain zones security expertise. Back to the presentation topics, here's a quick look at our domain statistic. .rf is the largest IDN top-level domain in the world. It has almost 800,000 registered domains at the second level, and they are all Cyrillic.

With a very high level of domain delegation, as you can see, most domains are older than four years, so their zone is stable and strong. As I mentioned before, .rf is the largest IDN in the world, so this largely, I prefer to think, due to our activities in the IDN and email address and translation area. And now I will tell you more about them. Let's start with their research, and I'll try to make more technical details in that way.

The first one is annual research of the top 300 most popular websites in Russia. As input data, we take domain names of the most popular Russian websites. Our partner Mediascope provides this information for us. It's a statistic gathering organization. Our primary analysis relies on a custom crawler platform based on open-source software stack. The key components are shown on the slide. You can see this tool is designed to get the links to web page with email forms whenever it's possible.

Next, unfortunately, comes manual data processing. We manually check websites. First of all, we're trying to make the list more full, so we check websites, market, no email forms founded by the crawler and check is there form or not. This includes cases for example like accounts requiring phone number authorization before you can access to the personal webpage with email forms.

And finally, we have a list of the links to the page with an email input forms. We manually test forms using test email addresses of the following types, you can see on the slide. We use ASCII email addresses to check the operability of the email service and after that we test the sites with different types of EAI addresses to verify its ability to accept them and after that to send emails correctly. And we check for the presence of test emails in all types of mailbox of our test addresses and save the result in the whole list.

So, the acceptance results over two years period are the following. Of the 300 websites analyzed, approximately half contain webpages with email input forms. Of these, one third accept emails within an ASCII local path. In our direction of language, it's before the symbol at.

And one-fifth accepts emails with Unicode local part. Email sending results are much less encouraging. Only four sites during two years successfully deliver emails to addresses with fully Unicode parts.

Another research project is annual research of SMTPUTF8 extension support in .ru and .rf zones. The extension indicates

whether ML server support EAI address handling. We identify A records associated with MX, Mail Exchange records of domains from the zone files and establish telnet connection to them.

Next, we analyze the server response for the presence of SMTPUTF8 announcements and save a list of such records. After that, we deduplicate the data and manually remove irrelevant entries, for example, different void MX and so on.

Finally, we obtained statistics on the number of domains and email services supporting SMTPUTF8 and the types of email services software which they use. So, we have observed the growth in the number of domains using services with SMTPUTF8 support as well as increase in the number of such services themselves.

Over the past three years, as you can see, as you've shown on the slide, it's in .rf IDN domain and the ASCII domain, .rf. And the top three most popular services of the solution with SMTPUTF8 support in our zones are Exim, Postfix and Microsoft Exchange in the NLS part. So, most of them are open-source Exim and Postfix.

Moving from research to practical implementation, first of all, we have IDN domains in the .rf TLD for all our web projects, of course. We've built an EAI email service, our internal, based on the Communicate Pro solution. We've improved our ticket system to level one of universal acceptance, which means it can send and receive emails from EAI email address.

We maintain and develop numerous projects and services that support IDN, EAI. Most of them incorporate modern approaches and leverage emerging technologies. The first one is, of course, [foreign language - 00:30:12] rf, which can be translated like support.rf. It's the main our ID and EAI project aimed to develop an ecosystem of support domain names and email addresses in national languages, primarily in the of course Cyrillic top-level domain .rf. It has a lot of materials, services, tools related with the universal acceptance.

We have internal technical Wiki with different media information, for example, records of workshops, some instructions of how to set up and install e-mail services and many, many, many other things. But that's definitely a theme for one more presentation. I'm afraid I haven't so much time for that, but maybe next time.

And today to serve as some bridge to our further discussion, sorry that I'm going to a bit forward then, our moderator, I apologize for that, I would like to highlight the final item listed on the slide. It's our AI-powered domain name recommendation service for domain registrations, which utilize the popular in Russia large language model, YandexGPT-5 Pro. And that service is pretty cool, and we like them.

About education, we actively participate in various lectures, workshops and hackathons focused on the Internet domain industry and emerging technologies. One notable example which I want to share with you is our collaboration with digital professional

development department at the Moscow Aviation Institute. We propose the following task.

AI-based text data processing to identify internationalized internet identifiers and convert them into hyperlinks. Moreover, the solution had to handle some mistakes in that, for example, splitting words on something like that. Three student teams from the department, a total of 41 students, opted for our task.

Our role was to provide information support while the teams independently selected their methods and soft words stack. The stack you can see for different teams on the slide. And as I see, I have a bit of a run of time, so I'll list the next one.

In conclusion, I'd like to outline our future plans regarding to ID and AI. We plan to upgrade our SRS, our registration system to include email address and translation support, support that addresses, initially as secondary addresses, but we will see in the future how it will be handled.

We will continue our research into malicious registration detections. It's another time for another presentation when we're trying to make some models how to prevent malicious registration, including handle of different indicators, and one of them it's a homoglyph of course and we are trying to ensure its full compliance with IDN requirements.

And we are continuously improving our services to meet IDN-EAI support standards across the board and there are many more

things I can tell you about, but again maybe next time . Thank you and if you have any question, I will be happy to answer.

ABDALMONEM GALILA

Yes, it is only one comment. Okay, go ahead please.

AKSHAT JOSHI

Hi, this is Akshat for the record. So, you have, in one slide you were talking about online trademark recognition system of some kind?

VADIM MIKHAYLOV

Yes, it's our collaboration with another partner, it's online patent, which provides for us connection with the base of patents.

AKSHAT JOSHI

Sure. I have a two-part question regarding that. First is, does it work with mixed script domain names, meaning Latin as well as Cyrillic ones? And if it does, then how does it distinguish between the script [CROSSTALK]?

VADIM MIKHAYLOV

As I mentioned before, we have in .rf only Cyrillic and .ru only Latin. So, we haven't in our zones any script mixing at all. So that's why it doesn't work with that.

ABDALMONEM GALILA

Yes, other comment that in chat box actually confirm what my colleague Vadim said that, thank you for disallowing characters from other languages in your TLDs that could be used for confusions or phishing to look like domain names. Mr. Eric. Yeah, it's same like you said. It's domain name, it's only same language and style. Yeah, which is look feasible, by the way.

So, Mr. Arnt Gulbrandsen is the ICANN UA technology senior manager, will give us more information about the universal acceptance readiness of open source languages, frameworks, APIs, web server, SMSs, meals and DNA software. Mr. Arnt, the floor is yours.

ARNT GULBRANDSEN

Thanks. So, I'm Arnt. I work with this. My work focuses on remediation. Generally, I work with the invisible software at the bottom, fix things, talk to developers. In this talk, I'm going to talk about the status of the software and not much about user interfaces. I divided it into four areas. Mail software, web software, libraries and frameworks that everyone uses, and of course the languages themselves. Next slide please.

Programming languages today are open-source software. You don't often think about them that way, but they are. All of the Python internals, for example, are on GitHub. Ten years ago, when something about Python was a problem for me, I got it fixed because you can contribute to open software.

The goal for UA in languages is that there should be no universal acceptance problems. If you as a programmer write a feature in your program that does something, then the language should naturally make that something happen. Your feature should be UA ready. If you write something to send mail, then the languages send a message, features should be UA ready, you should need to do nothing.

We, our team, focus on the top six, seven, ten programming languages. The status is a little bit mixed now. I have an example here, JavaScript. When you need to convert a domain name to A labels for back-end use, JavaScript does that transparently, automatically. You don't need to think about it at all. It just works completely UA ready. But if you want to convert a domain name to display, the story is a different one. In that case, UA readiness is far from automatic.

It's difficult to assess how ready this is in percent. The common task is ready, the uncommon task is not. It's difficult to fix a number, so we focus on making things readier. Happily, all of the top languages now are at least partly UA ready, depending on what you want to do. The next frontier is the frameworks. Next slide please.

Many programming languages do things using plugins now, for example, NPM for JavaScript Node or modules for Go. If you want to do something, you will generally use a plugin.

Taking Go as an example, the Go book starts by showing Hello World. Not a surprise. That's the first page of the first chapter. But the second page, the next most important thing in the language is to use third-party modules. This again makes it a little difficult to fix a percentage to UA readiness, because in case of Go and also in case of JavaScript, there are two popular modules for reading mail, two popular modules for sending mail, one of them ready, one of them not.

It's difficult to fix a percentage, but it's very easy to find the code because it's all on GitHub and all easy to find. We are contributing fixes to those where it's needed, in both of those cases actually.

The ICU library is a great example of this. ICU is a library by unicon.org, which is used in very many programming languages, some of them directly, some of them indirectly using something called wrappers and it has UA-ready functions for many purposes.

One thing it has not yet had is linkification, which is the process of recognizing that a word in a sentence is really intended to be a link. You see it in every instant messenger. ICANN is currently contributing that to ICU. We hope that this will lead to immediate wide support. Next slide please.

Web servers. I said I wouldn't talk very much about user interfaces, but well, web is interface. UA readiness requires support for internationalized domain names, currently needed in web servers, in content management systems that provide content for the servers, in the TLS subsystem where there's a lot of mostly invisible

software, and of course domain name support needs to work in browsers.

The IDN support is mostly solid, perhaps with the exception of cut and paste in browsers. People disagree about exactly how that should work, but it's not quite good. What users see should be human readable and it certainly isn't always. The rest of domain name support is solid.

Content management systems however need more than IDNs. They need email address support, they need username support, many links should be readable even links to other sites. There shouldn't be much percent encoding.

ICANN has contributed code to improve two of the top three content management systems. The third of them, the biggest, is a little behind, but we are contributing code now, and the team there is aware of the problem and they want to solve the problems. So, it's mostly a matter of exactly when and how at the moment. It's not a question of whether it will be done, it's a question of when and details of how.

Browsers need two things. They need domain names and support. The domain support is mostly invisible to users. Browsers use domain names for some security things, for example, to make sure that your login for one site does not end up being revealed to another site. That has to work even for IDNs. We are not aware of any problems in that area though.

Email address support in browsers is more of a pain point. Progress was blocked for many years in discussion in the W3C. There was some discussion about exactly what the support should do that prevented any progress at all. You can read the whole thing on GitHub if you want. It's long-winded and I would say that some people have very strong opinions there. Next slide, please. That gets us to mail.

There are three major kinds of mail service. We need all three kinds. We need what you run on-premises. We need the kind that somebody runs for your company hosted by them and of course we need big free mail hosters. Gmail is the biggest example of that. All three are absolutely necessary, because none of the three can replace the other two kinds.

On-premises software includes several UA-ready options now. If I remember correctly, four of the five biggest SMTP mail servers can be configured to be UA-ready now. And for storing mail, there are several open-source options. I named three here.

DoveCot is the most widely used. The developers themselves claim that it has more than 50% market share. Their claim, not mine. Stalwart has a lot of buzz now and it's growing. One of them is configurable to be ready, the other one just is ready by default.

Several of the largest hosters can send mail to and from Unicode. Although being able to host Unicode at Unicode addresses remains a gap. Here in India, there is a provider who will do it, globally there remains a gap. Mail readers, particularly for the smartphone, are

coming along. Thunderbird is famous and the last small UA readiness bug was fixed a few months ago. This means that the version on people's smartphones is now ready and happy.

The desktop version of Thunderbird is a little behind. I don't remember what the last problem is, but there is a remaining known problem. There are other smartphone apps that work partly depending on the server. Users may or may not notice them. Of course, my job is to notice things and dig into them, so I'm going to be unhappy even if the user is happy.

When my team tested webmail systems last year, we found a couple of webmail systems that were good already. We tested the release and unreleased versions of five systems. Three were ready in the unreleased tip, so in this area too, the world is progressing. The status is not bad. Next slide please.

And software alone is not ready. We need to talk about the DNS status as well. The DNS status itself is fine, which includes the three big web browsers.

A couple of years ago the last of them upgraded, so we now have harmonious, trustworthy handling of IDNs. That just works. Someone who wants to register, for example, a Devanagari domain might also want to use a Devanagari contact address for doing that.

Support for that was published recently in RFC9873. The registries and registrars need to do some work to implement it in software before users can use it. They should be doing that now. Following

that is not my own job. I will just hear about it, so I can't give any status.

The next major upcoming work concerns domain variants. There's been an EPDP at ICANN concerning that. The IETF is not going to work on the EPDP, rather it will provide technical foundations. Domain variant is when two spellings are considered equivalent in some sense, because diacritic or accent is optional in one language. The exact rules depend on language.

The IETF work will just provide the ability to have that, a set of domains, without going into details of what makes that set equivalent. That will be a matter for the registries. Work is proceeding. Next slide please. And this is the final slide.

A lot of the bugs that we see are similar in some way. For example, a lot of the bugs that we see are about forgetting to decode an IDN. Many systems do that. I expect that AI code review, which is becoming very fashionable, will catch that thing routinely. The AIs are good at transporting knowledge from system to system, even if I haven't seen that exact bug being caught by AI yet.

User interfaces have some additional bugs. Again, the same bugs occur in many projects and AIs will be used to spread the knowledge. It's good news for catching bugs. Something small that matters to developers, but won't be visible outside is typing. If you're a developer and you want to fix a bug that concerns Nepali, but you don't have a Nepali keyboard, what are you going to do?

Now, if you use an LLM, the Nepali knowledge of the LLM will be good enough to help the developer. It can type a few words of them of Nepali. Even if it doesn't know Nepali well enough for a user interface what we developers want is often two words for a unit test and the AI knows when to insert a check which is a Nepali thing that very, very few people have on their keyboards.

Als have another skill that matters for universal acceptance. They are great at suggesting things. The suggestions may be right and wrong, but just being a suggestion is a commonly valuable thing. When I am stuck as a developer, a suggestion can help me unblock, and Als actually have helped me personally with suggestions that were wrong. They got me going, and I did get a UA bug fixed.

The last example is from GitHub, actually. I saw it on some software that broke on one particular domain, even though it worked on 500 others that they had tested. The team could not see what was particular about that domain, but the AI noticed the peculiarity and could suggest something.

The same is true for suggestions to end users. A lot of registry software will suggest domains to register, AI can boost that. I think I'm out of time. I would have talked a little bit more about suggestions and how good they are because I love the power of suggestion to unlock myself personally. I'll quit here though. Thanks for listening.

ABDALMONEM GALILA

Thank you, Arnt, for this introduction to the role of AI in order to accelerate the adoption of universal acceptance and the use of IDNs and AIs.

Actually, AI is one of the emerging technologies that the presents a significant opportunity to accelerate universal acceptance and adoption in the domain name industry. In this wallet, we have more than 380 million domain name registrations globally, with other 60 plus IDN ccTLD operation, and the increased number of email address internationalization mail server readiness, they are increasing from 20 to 2022 to 28 by 2025.

I could say that AI offers a pathway to identify, remediate, prevent UF failures that exclude millions of internet users from being online. Let me start first by the first buy that is related to AI. The first buy is related to the existing capabilities that AI offers and could be extended for UA purposes.

The first one is related to domain name generation, GoDaddy and name ship as one of the example using suggestion tools that uses NLB to generate brandable and available domain name registration and improve registrar conversion rates. However, this kind of tools suggest only ask domain names and they rarely suggest IDNs which reveals a significant UA readiness gap.

Second point that offers by AI is related to DNS abuse detection and mitigation. There are tools that use machine learning that are

increasingly used to detect malicious domain names, registrations, alongside homograph attacks.

There are plenty of project and initiative from organizations like ICANN to improve the detection accuracy. At this time, AI technologies could also support universal acceptance by differentiating between legitimate IDNs from abusive ones and reduce false positives.

The third one for AI that could offer is related to customer service, which is our main priority. There are a billion of chatbots like Interconfiner, Zendesk, Salesforce are widely used by registrars and hosting providers to provide multilingual customer support. At this time, we don't have any real evidence that this tool is compliant with universal acceptance readiness and could read or deal with IDNs and AIs.

Second slide, or second point, is lead to the gaps from the current AI applications that we could have this gap in order to have innovations. There are seven key application areas that emerge where AI could meaningfully advance universal acceptance adoption in the domain name industry.

The first one, automated UA compliance testing and remediation. There are systems that could scan websites, applications, APIs to detect universal acceptance issues such as failure to handle IDNs, EAs, and new gTLDs. Based on the testing framework published before by Universal Acceptance Steering Group and from the

guidance of ICANN, these tools could scale to be universal acceptance compliant.

Second one, AI powered code generation for UA-Ready applications. There are assistance AI coding like GitHub, Amazon CodeWise Peter. For example, if you go to Google now and search for something, you will have, chatbot will answer your question.

The developer uses this kind of tools to generate some kind of code in order to be used inside the software application is not UA compliant. So why not going to such chatbots and ask them to be compliant with IDNA2008 and be compliant with universal acceptance readiness.

Third point, intelligent IDN-aware domain name suggestion. There are tools, as I said, used to generate or suggest alternative domain names that are IDNs based on user language that's already at the system, the location, and the market. All of these help to promote multilingual internet.

There are more insights, published insights from ICANN, for example, CircleID highlights that integrating IDN recommendation alongside ASCII domain names could significantly increase IDN adoption.

Since two years ago, I received an invitation, a kind invitation from .imrat. They would like to introduce the AI tools that could recommend such kind of Arabic domain names, whatever your interest, you will have the result for this. It was very successful.

The first one is related to legitimate IDNs versus homograph differentiation. AI system could improve security by differentiating between legitimate IDNs from malicious homograph attacks reducing false positives that currently discourage IDN adoption.

The fifth one, UA readiness regardless to AI customer service platform. Most of the platform now depends on chatbots and CRM system that used by registrar and hosting provider should be universal acceptance ready as well.

61, 61 is related to predictive analysis for universal acceptance adoptions. AI system could analyze domain name registration, DNS traffic, email infrastructure data to predict universal acceptance adoption trends and identify key inflation points.

The last one, the last seventh one, is related to registry operation for universal acceptance compliance. We have Zoon Generation, we have Whois data, we have EBB Transaction. All of these kind of modules should be universally acceptance ready in order to encourage such domain name of IDN registrations.

At this point, I will open the panel, I will open the discussion for our panel that will include Mr. Arnt from ICANN, Mr. Sameer from Bahrain who are in remote, and the other panel for today in order to answer one of the most important questions. Okay, sorry for this.

So, I will open the floor now for the first question. I will start by Mr. Michael. Can EAI meaningfully advance universal acceptance

adoption? If yes, how can EAI be applied to address universal acceptance challenges from your point of view?

I know Mr. Michael, who is the one who drafted or makes the document that how to make your registry system or registry set to be EAI compliant. So, I will offer the floor for you, Mr. Michael.

MICHAEL BAULAND

Thank you very much. Yeah. A few years ago, we created this UA roadmap for domain name registry and registrar systems together with ICANN. For that we tested our registry system, the core registry system and the core registrar system. And we did this at that point in time manually.

So, we came up with all kind of different domain names, email addresses, and checked whether all the connection points in the software, the input, output, storage, would work correctly with this. It turned out that there were a few small problems with IDN and email handling, and we then took a look at the code and tried to fix this.

Now with AI, this could possibly speed up the process. On the one hand, writing the code, you could already ask an AI model like Claude to write me a method that validates an email address so that that is UA ready.

I just tested it this morning for Java and it produced a code. It was not bad. It didn't work perfectly, but it's definitely better without knowledge about UA simply write a check yourself. But it took

some iterations to get a code that is actually close to perfect. But still, especially if you've got not much knowledge about UA readiness, how to write the code, these models can be quite helpful.

ABDALMONEM GALILA

Thank you, Michael. Yeah, Vadim?

VADIM MIKHAYLOV

Honestly, I am not so involved in the backend operators' technical stuff, but I definitely know that in a lot of discussion with technical administrative system, administrative technical guys we face to the problem that sometimes to make your service you are ready, universal acceptance ready, you just need simple instructions. Step-by-step basis, how to do it with your, for example, software stack and it's just idea.

We are thinking about and actively researching the possibility of creating thematic prompts for universal acceptance tasks and building repository for them. Honestly, it's not our idea, it's not something new.

In Russia we have, I think, the most popular LLM, Large Language Model and Artificial Intelligence is based on them. On it is Yandex AI and we are planning to discuss this possibility with the Yandex Prompt Hub.

It's a project that provides a database of real prompts for different cases. For example, if you need some medical kit to go in any

country that can count the specific of the country so you can ask and you have prompts for that. And we are thinking about that we need a bulk at least or a category of the prompts which have been tested and moderated to prevent.

So, for example, AI hallucination or some fake results and the theme of this or category of these prompts it could be a universal acceptance stem in the practical way. For example, how to setup and install some open-source server or persons you may last address internationalized email service, for example. What you do need first, like first step second step and so on.

Honestly, I just started to test and we see, some time I do it my own and I see sometimes that AI have some mess up with the versions. For example, the solution can be from another version of the software and that's why we need to train that model more.

So, I think for integration to the registry service or any other IT service that have own infrastructure including email service, it's very useful part to have some prompt that you can click and give results. Thank you. That's my view.

ABDALMONEM GALILA

Thank you, Vadim. Before going for our next speaker, Mr. Sami, it is shared at your screen now, the seven areas that could be used to accelerate universal acceptance and adoption using AI.

You will find here the complexity of implementation column and the UA impact for the market and the priority. You will find here

that there are three items, three areas that have high priority in order to be, to start with.

The first one or automated UA compliance testing it is used to measure the universal acceptance progress, your infrastructure within this progress so it is high. And the second one is about UA-Ready code generation as most of the tools that's used by hosting provider, the registrar are using this kind of codes that should be compliant with IDNA2008 and universal accessibility readiness. And the last one is related to customer service, which is our main goal. Mr. Sami, go ahead, please.

SAMI MOHAMED ALI

Hello, everyone. This is Sami from Bahrain. So just to add from the UA AI perspective, currently in the region, there are a lot of registrars who have started using. Again, it's more about engaging with community and creating the awareness of AI and part of the responsibility that Telecom Regulatory Authority Bahrain has is to develop the framework, regulatory framework for AI to be used across the kingdom.

So, we are working on that, building the AI policies and AI regulation and part of that was to encourage use cases from AI. And one of the use cases, one of the registrars in Bahrain has implemented is the predictive or the suggestive names when it comes to searching for domain names, which is a very basic solution, but it starts engaging with people when they put in

prompts and they get the available domain names in different zones to be shared with them.

And this is the same, what's it called solution that has been used in other regulatory authorities in the region as well. So this is one of the very basic AI tools that is used and is helping promote the domain name and the IDNs when it comes to get the suggestions for the names.

As my colleague, Abdalmonem mentioned that the priority is for customer service. So, again they are using a lot of chatbots which can speak in Arabic and English when it comes to promoting the languages in Bahrain. So, these two are the starting points for universal acceptance adoption when it comes to creating the appetite for the end user so they can start working with the AI based solutions for the IDNs Thank you.

ABDALMONEM GALILA

Thank you, Sami. Mr. Sameer.

SAMEER GAHLOT

Yeah, so in the morning, Mr. Rajiv has also presented which are the areas wherein we are using AI and emerging technologies. So, within NIXI, we are working on the awareness as well as using the emerging technologies to make the adoption of IDN in more rapid pace. But at the same time, I would like to mention that there is this program where we are upscaling the younger people. And one

of them has recently developed a chatbot which is based off like a UA-based chatbot.

And this is how the emerging technologies and other ideas while we are promoting, but at the same time we are upscaling the current population as to how to move in a direction wherein not everyone is moving. And more importantly, we recently winded up or you could say that concluded, successfully concluded the India AI impact submit. Wherein I get a chance to present one of the paper, it's multilingual AI in universities.

Wherein we usually talk about the digital divide, but there are second and the third level divide. Like, for example, if consider me as a student and if I'm going abroad for studies, then I usually may not be well-versed with the English language, then providing the students in universities or academia with the domains which are in their own languages makes a sense of belongingness and could definitely push this initiative in a direction which would be relevant and at the same time we could use these emerging technologies in this area. So, yeah, over to you.

ABDALMONEM GALILA

Yeah. Thank you, Mr. Sameer. We could have one question from the participant here. Any question? Excellent. Vadim.

VADIM MIKHAYLOV

Thank you again. I just want to share our experience in testing and automated universal acceptance compliance testing. We placed a

problem that's very simple. The problem calls CAPTCHA. So that's why we are testing websites.

We have crawler, as I mentioned, that can gather for us a bulk of links, but after that, we need to manual test for acceptance and some to definitely for sending and some time for acceptance. And that, the race, really race we are thinking about to implement of some artificial intelligent tools to avoid CAPTCHA and so on, but it's a race of technologies because the owners of websites protecting themselves from bots different and from malicious bots for that sites it looks like we're doing the same, some malicious activity or some suspicious activity when we're trying to use automated tools for testing. So that's one problem and we still have it. Maybe if you have some solutions, please share. I would appreciate it really.

And one last point that I want to mention is, for my humble opinion, the artificial intelligence, it's a tool. It's a tool in someone's hands and if the hands are trying to create something, to do something really good, like we all, the artificial intelligence is a very, very useful tool. But we shouldn't forget that sometimes it's used in malicious purpose, for example, service suggestion of domains can be used, for example, for generation of the [inaudible - 01:14:43] bundle. You should remember it when we are applying the services.

Sometimes we need to notice our users that use our service, how it can be used by attackers or by some malicious purpose. So, thank you.

ABDALMONEM GALILA

Thank you, Vadim. Michael, you would like to say something? Yeah, we are at the end of the session exactly... I would like to highlight that the membership for Universal Acceptance Committee open for any ccTLD who is a member of ccNSO or not even a member, even working for organizations that operate ccTLD could be a member of Universal Acceptance Committee .

One of the main target behind the decisions that would like to highlight that one is that there are emerging technologies that could help in order to foster the adoption of universal acceptance. Thank you very much for your attention for today. Thank you. Bye-bye.

[END OF TRANSCRIPTION]