🗞 Press release

Octan announced the release of the Web 4.0 specification, an internet layer that allows humans and their AI assistants to interact in natural language with non-humans (e.g., organizations, places, objects, and animals). By clicking, tapping, or scanning a Web 4.0 locator with a ubiquitous chat app, users can now share their online data, present offline credentials, ask questions, fill out forms, execute workflows, pay for transactions, manage records, and connect devices to the internet – all of these with minimum inputs and maximum confidentiality.

"Besides supporting and simplifying most of the use cases in traditional Web 2.0, Web 4.0 creates a plethora of potential new use cases, from paperless international travel to navigation on underground metropolitan stations. This democratization of ambient computing allows users to chat with nearly anything, from buildings to books and coffee machines, in a personalized, contextually aware, and unobtrusive way." - Sam Patel, Global Internet Study.

Web 4.0 takes the recent developments on agentic AI and applies them to the vision of a new decentralized Web 3.0, giving back to users the control over when interactions start and stop, where their data resides, which data is shared, and how they pay. The distributed nature of Web 4.0 removes the dependency from any single organization, nation, or distributed ledger – nonetheless, Octan is committed to work with all major cloud providers, nations, and organizations to help them and their constituents onboard in a sovereign and compliant fashion.

"Our customers want to accelerate the return of investment in GenAI, but they've been facing numerous challenges. These include LLM accuracy and guardrails, data residency and retention, third-party agentic AI discovery and integration, streamlining click-to-pay, and resourcing of frontend and mobile developers. Web 4.0 reinvents the way we address these challenges by inverting UX, personalization, and privacy dependencies, while leveraging ubiquitous technologies – this allows us to easily enable and onboard organizations." - Alex Silva, Global Consultancy.

To support organizations upgrading from Web 2.0 to Web 4.0, Octan released the Web 4.0 open-source stack – an SDK for businesses to deploy Web 4.0 compatible services in the cloud, for now supporting AWS only. For end-users to browse the Web 4.0, Octan released also a Web 4.0 open-source wallet – a chat app available for Android and iOS. The wallet uses a set of default Web 4.0 agentic AI services managed by Octan – these services are publicly accessible by any organization running on any cloud provider, allowing the community to bootstrap while Web 4.0 matures.

⛰️ Evolving Web 2.0 landscape

This section aims to:

1. enumerate each of the key Web 2.0 dimensions that Web 4.0 covers and why.
2. explain the relevant industry concepts of each dimension.
3. provide examples of investment from governments and tech giants.
4. and introduce Web 4.0's approach to address the challenges of each dimension.

The landscape assessment explores three perspectives:

1. 💼 **Business landscape** - i.e., the motivations of companies.
2. 🧑 **User landscape** - i.e., the motivations of nations and citizens.
3. 🌳 **Ambient landscape** - i.e., the user interactions with the physical world.

💼 Business landscape index

- 🗂️ **Profiling**:
  - how tech giants collect, use, and share vast amounts of user data.
  - why nations are turning to sovereign clouds to protect their citizens.
  - and why Web 4.0 aims for a distributed web with near real-time data sharing.
- 🔎 **Searching**:
  - how Google's search dominance is under regulatory scrutiny.
  - how users are turning to social media and GenAI to find information.
  - and why Web 4.0 aims to search self-sovereign distributed domain manifests.
- 👀 **Advertising**:
  - how Google and Meta dominate advertising leveraging deals with Apple.
  - how Apple and Google proxy user behavior in iOS, Android, and Chrome.
  - and why Web 4.0 aims for contextualized ads based on self-personalization.
- 💳 **Paying**:
  - how the payment industry is simplifying check-outs with QR codes and NFC.
  - and how nations and tech giants are centralizing platforms for interoperability.
- 🗂️ **Pay with App**:
  - what are the dominant apps in Brazil, China, India, and United States.
  - how regulated peer-to-peer payments and financial wallets are picking up.
  - and why Web 4.0 aims for users to use their own payment method in any country.
- ✋ **Pay with Palm**:
  - how China and the United States are implementing palm vein payments at scale.
  - and why Web 4.0 advocates for palm payments with sovereign privacy obfuscation.
- 🗒️ **Subscribing**:
  - how tech giants sell and manage subscriptions for users and businesses.
  - and why Web 4.0 advocates for self-sovereign subscription management.

68 • 🛒 **Shopping**:
69   o   why China's super-apps are hard to replicated in the fragmented U.S. market.
70   o   why India chose to create a central product catalog accessible by any app.
71   o   and how Web 4.0 connects apps to distributed self-sovereign product catalogs.
72 • 💬 **Chatting**:
73   o   what do Google, Meta, Tencent, and Walmart envision for business messaging.
74   o   and why Web 4.0 advocates for business transactions in natural language.
75 • ☀️ **Scanning**:
76   o   how QR codes and NFC tags became ubiquitous in payments, menus, and others.
77   o   how Apple addresses security concerns around QR phishing with App Clip Codes.
78   o   and why Web 4.0 advocates for QR/NFC to connect and cognify almost anything.

79 ## 🧑 User landscape index

80 • 🛰️ **Connecting**:
81   o   how SpaceX, Amazon, and China are in a race to deliver internet via satellites.
82   o   and why Web 4.0 sees internet in airplanes and remote areas as inevitable.
83 • 🧢 **Personalizing**:
84   o   how personal info (PII) is abused and protected by tech companies and nations.
85   o   how self-sovereign identity (SSI) protects PII with zero-knowledge proof.
86   o   and why Web 4.0 advocates for personal vaults and self-sovereign digital twins.
87 • 🈂️ **Traveling**:
88   o   how companies, nations, and intergovernmental organizations see digital travel.
89   o   what are the challenges of establishing globally accepted digital credentials.
90   o   and why Web 4.0 advocates for a hierarchical distributed trust framework.
91 • 🆔 **Identifying**:
92   o   how companies, nations, and international organizations see digital identity.
93   o   why government-led digital identity programs success where tech giants failed.
94   o   and why Web 4.0 advocates for sovereign digital identity delegation.
95 • 🗂️ **ID Wallets**:
96   o   how tech giants are enclosing digital wallets in their mobile ecosystems.
97   o   how nations are implementing their own sovereign digital identity wallets.
98   o   and why Web 4.0 advocates for none, opting to augment chat apps instead.
99 • 👮 **Supervised ID**:
100   o   how nations are using biometrics at scale (e.g., face, iris, finger, palm);
101   o   what is the difference between identity recognition and identity verification.
102   o   and why Web 4.0 advocates for supervised verification delegated to nations.
103 • 🧙 **Unsupervised ID**:
104   o   how countries, banks, and ride sharing companies remotely verify identities.
105   o   why remote liveness check is more secure than phone-based face authentication.
106   o   and why Web 4.0 advocates for web-based remote face scans with liveness checks.

107   • 🔐 **Passwordless ID**:
108   ○ how tech giants are adopting passkeys for user passwordless authentication.
109   ○ how emails servers have used passwordless domain authentication for decades.
110   ○ and why Web 4.0 advocates for passkeys for users and domains for businesses.
111   • 🖊️ **Signing**:
112   ○ what nations adopted digital signatures and what tech providers support it.
113   ○ what is the legal weight of digital signatures and their legal requirements.
114   ○ and why Web 4.0 advocates for trusted digital notaries to recognize signatures.
115   • 🤖 **Delegating**:
116   ○ how tech giants promise intelligent autonomous assistants at least since 2016.
117   ○ how generative AI and AI agents reignited assistants as copilots in 2024.
118   ○ and why Web 4.0 breaks them into assistants, orchestrators, and providers.

119 🌳 Ambient landscape index

120   • 🏡 **Smart Homes**:
121   ○ what is ambient intelligence, the foundation of smart homes, buildings, and cities.
122   ○ what are recent breakthroughs in radio-frequency charging and mesh networking.
123   ○ and why Web 4.0 advocates for devices with Matter, LoRaWAN, and RF charging.
124   • 🔑 **Smart Keys**:
125   ○ how safe are keys for physical access (e.g., locks, padlocks, fobs, badges, cars);
126   ○ what the protocols supported by smart keys (e.g., NFC emulation, biometrics, UWB);
127   ○ and why Web 4.0 advocates for active NFC keyholders and passive NFC locks.
128   • 🧑‍⚕️ **Smart Health**:
129   ○ what is smart health, and how it depends on data from wearable smart devices.
130   ○ how much data is collected by wearables, and why it should be shared with doctors.
131   ○ and why Web 4.0 advocates for personal sharable AI-augmented time-series vaults.
132   • 😎 **Smart glasses**:
133   ○ how is the smart glass technology in the U.S. and in China.
134   ○ what are the offers of tech giants like Apple, Google, Meta, and OpenAI.
135   ○ and why Web 4.0's natural language interface simplifies glass adoption.
136   • 🧠 **Brain Computer Interfaces (BCI)**:
137   ○ what is BCI tech, and who are the main U.S. and China players.
138   ○ what is Meta, Neuralink, and Synchron doing around BCI.
139   ○ and why Web 4.0's natural language apps enable seamless brain-to-app inputs.

🦅 Sovereignty pledge

Web 4.0 envisions a new era of the internet built on trust, resilience, and sovereignty.

- This sovereignty pledge outlines the guidelines to provide users, businesses, and governments with greater control over their data and digital presence.
- Web 4.0 prioritizes privacy, security, and localized governance, ensuring every stakeholder retains autonomy in a connected world.

The Web 4.0 sovereignty pledge focuses on three main stakeholders:

- 👱 Users (i.e., citizens)
- 💼 Businesses (i.e., private sector)
- 🏛️ Governments (i.e., public sector)

👱 Users (i.e., citizens)

1. have access to the internet from virtually anywhere.
2. access services anytime, from anywhere, or from any product.
3. use passkeys to authenticate with businesses, not passwords.
4. exercise entitlement anonymously - i.e. zero-knowledge proof.
5. keep the data output of services, and share it with other businesses.
6. own their multi-persona digital twins and decide when to share them.
7. influence their advertising persona and contextual next-best actions.
8. search, interact, and pay for services in their language from any app.
9. pay with their preferred method, regardless of where they are.
10. manage all only debits and credits from a central user experience.
11. can delegate business interactions to their AI assistants.

💼 Businesses (i.e., private sector)

1. use domain certificates for authentication, not API keys.
2. access third-party services on-demand, without onboarding.
3. publicly manifest their products and services to the world.
4. manage all only debits and credits from a central user experience.
5. can interact with the ecosystem without the need for specialists.

🏛️ Governments (i.e., public sector)

1. interact directly with their citizens.
2. keep their citizens' data within sovereign borders.
3. proxy and obfuscate their citizens' biometric verification.
4. ensure businesses only provide services legally advertised.
5. ensure businesses only request user data relevant to the outcome.
6. enforce laws and regulations on citizens and businesses.

🔗 Web 4.0 Ecosystem

The Web 4.0 ecosystem specification aims to simplify everyday business transactions by streamlining interactions between users, organizations, and things, while ensuring security and performance at a global scale.

- **Users** interact with the ecosystem with their Wallets 👱 - these are mobile apps running on mobile devices that depend on a Notifier 📢 domain for device-specific communications, and a Broker 👱 domain for session orchestration with organizations.

- Users extend their Wallets' features with **agentic vault domains** (e.g., Storage 📦, Finder 🔍, Persona 🧢, Curator 🧚, Payer 💳, Identity 🆔, Concierge 🛎️, Scheduler 📝, Navigator 🧭, Vitalogist 💖, Mingler 🖨️, Reviewer ⭐, Timeline 🕐, Custodian 🎩, Keybox 🌼).

- Users use their Wallets or their **wearables** (e.g., Userables 💍, Tapbands ⌚) to interact with Padlocks 🔒, Robots 🤖, and other smart Things 🔶.

- **Organizations** interact with an email-like inbox API behind a domain name and can assume a multitude of roles in parallel (e.g., session Host 🤗, business Seller 💵, data Consumer 💼, user-bound Vault 🗄️, event Streamer 🎏, and asynchronous service Supplier 🏭).

- Domains are extended by **helper domains** (e.g., Buffer ⏳ for global ingestion and throttling, Collector 🏦 for payments, Biller 🤝 for financial contracts, Advertiser 👀 for ads).

- **Data integration** is assured via Schema Codes 🧩 that domains and Authorities 🏛️ can define on their domain Manifests 📜 - these codes are the foundation of resource Locators ☀️, physical Things 🔶, and verifiable offline Tokens 🎫.

- Domains interact directly with humans with **edge devices** that exhibit well-known behaviours (e.g., locator Scanners ✨, biometric Palmists ✋ and Selfies 📸, and circuit Relays 🎬).

- **Device integration** is assured by natural language Relayer 🛰️ domains that communicate with local Antenna 📡 hubs that aggregate Pluggable 🔌 devices and Wi-Fier 📶 routers.

- **Security** is assured by a Trust 👍 framework, digital signatures for Messages 📨 and files, global Firewalls 🔥 that actively monitor the ecosystem, Identity 🆔 domains that authenticate users on behalf of other domains while maintaining privacy and legal compliance, and Ephemeral 🦋 devices that dynamically rotate QR and NFC locators to prevent fraud.

- **Performance** at a global scale is assured by a distributed cluster of domain Listeners 👂 that propagate domain schemas and trusts in near-real time, and domain Graphs 🕸️ that cache them to support high-performant queries from any domain.