Rapid Evidence Review guidance

These Rapid Evidence Reviews are the result of findings from individual reviewers, followed by a collaborative moderation process with technology experts and the horizon scan team. This page contains the guidance given to reviewers for each field contained within the review, as well as a brief overview of the metrics
A (+) denotes a quantitative score as part of the technology assessment process.

Overview

A high-level overview of how this technology is developing and the key considerations, applications, and risks.

Summary of time to market

An overview of the Technology Readiness Level (TRL) for this technology.

Potential types of Hazards

A list of hazard types which may be presented by this technology, using the PRISM list of common product safety hazards.

Summary of potential harms and benefits

A summary of the key potential harms and benefits this technology may present to the user or consumer.

Summary of non-physical risks

An outline of the potential harms and benefits this technology may present in relation to non-physical aspects such as psychological, financial, reputation, privacy, data loss, and wider cyber-security issues, such as DDOS attacks.

Technology readiness level (+)

Selected from this defined scale of technology readiness: 1 – Basic principles observed; 2 – Technology concept formulated; 3 – Experiment proof of concept; 4 – Technology validated in lab; 5 – Technology validated in relevant environment; 6 – Technology demonstrated in relevant environment; 7 – System prototype demonstrated in operation environment; 8 – System complete and qualified; 9 – Actual system proven in operational environment.

Information availability score (+)

Selected by the reviewer based on the amount of information available on the technology: 1 – No or very little information; 2 – Limited/insufficient information; 3 – Information available to partially complete review; 4 – Information available to cover and respond to all metrics; 5 – A large amount of highly relevant information.

Information quality score (+)

Selected by the reviewer based on the reviewer's confidence in the range of sources: 1 – None or irrelevant sources; 2 – Mostly google search, other journalistic outlets, or sponsored information; 3 – Other grey literature; 4 – Established technology sources; 5 – Predominantly peer-reviewed sources.

OPSS remits score (+)

A score which corresponds to the number of relevant OPSS roles and cross-cutting activities selected from a list provided to each reviewer: 1 – < 4; 2 – 4 to 7; 3 – 8 to 11; 4 12 to 21; 5 – > 21.

Scale and ubiquity score (+)

A score comprised of one-third of the market size score, one-third of the CAGR score, and one-third of the enabled technologies score. The scales are as follows:

Market size score (USD): 1 – < $1 billion; 2 – $1 to $5 billion; 3 – $5 to 50 billion; 4 – $50 to $300 billion; 5 – > $300 billion.

CAGR score: 1 – < 9%; 2 – 9-15%; 3 – 15-25%; 4 – 25-42%; 5 - >42%.

Enabled technologies score (the number of additional technologies from the longlist that are enabled by this technology): 1 – 0 technologies; 2 – 1 to 5 technologies; 3 – 6 to 15 technologies; 4 – 16 to 35 technologies; 5 - >35 technologies.

Summary of scale and ubiquity

Description of the current and projected future scale and ubiquity of this technology.

Summary of relevance to OPSS

Outline of how this technology may relate to or impact on OPSS's roles and responsibilities.

Summary of macro-scale impacts

Outline of any potential harms and benefits this technology may present at a macro-scale, across STEEP (social, technological, economic, environmental, and political) fields, for example the environmental or social impact. Additionally, this section contains any potential harms and benefits this technology may present in relation to end-to-end product lifecycle, for example during manufacture, retail or recycling and disposal.

Estimated market size (USD)

Details of any available estimate in market size, in any geography at any time, offered in the literature. In some cases, the reviewer made a judgement call to which is the most robust market size given conflicting estimates, or extrapolated to make a current global market estimate in USD.

Estimated CAGR

Details of any available estimate in compound annual growth rate (CAGR), in any geography at any time, offered in the literature. In some cases, the reviewer made a judgement call to which is the most robust given conflicting estimates, or extrapolated to estimate.

Level of harm (+)

The most relevant consumer harm severity level for this technology, based on the PRISM framework, from this range: 1 – No harm; 2 – Minor harm requiring basic treatment/first aid; 3 – A visit to A&E may be necessary with short term rehabilitation; 4 – Hospitalisation and long-lasting or permanent impacts; 5 – Potentially fatal or severe loss of function.

Time to market score (+)

A score which correlates to the TRL, based on the following scale: 1 – TRL 1-3 (research); 2 – TRL 4-6 (development); 3 – TRL 7-8 (prototyping, demonstration); 4 – TRL 9 (market ready); 5 – TRL 9+ (already widely available in market).

Harms and hazards score (+)

A score comprised half of the level of harm (described above), and half the number of potential types of hazards (described above) using the following scale: 1 – 0 (no hazard); 2 – 1 hazard; 3 – 2 to 3 hazards; 4 – 4 to 7 hazards; 5 – more than 7 hazards.

Benefits and impact score (+)

A score comprised half of the macro-scale drivers score and half of the consumer-scale benefits score, using the following scales:

Macro-scale drivers (the number of the pre-identified contextual factors that the technology may impact on, selected from a list): 1 – 0 factors; 2 – 1 to 2 factors; 3 – 3 to 5 factors; 4 – 5 to 8 factors; 5 – >8 factors

Consumer-scale benefits score: 1 – No benefit; 2 – Minor benefit (e.g. greater ease of use); 3 – Benefit (e.g. cost or efficiency savings); 4 – Significant benefit (e.g. significant improvement to quality of life); 5 – Great benefit (e.g. life0saving)

Total score (+)

The sum of the following scores, each out of 5, to give a final score out of 25: time to market, harms and hazards, benefits and impact, OPSS remits, scale and ubiquity. Higher scores indicate a higher impact technology for OPSS, while lower scores indicate a lower impact technology.

Communications and digital
Decentralised internet

'Decentralised internet' refers to internet and digital communications deployed via peer-to-peer infrastructure (i.e. with decentralised or distributed network architecture), as opposed to centralised data hosting servers. Decentralised internet is the model that lies beneath the proposed 'Web 3.0' or 'web3', a hypothesised third generation of the Internet that would shift control of data into users' hands. Decentralised internet has been much-discussed recently in relation to blockchain and distributed ledger technology, cryptocurrency and NFTs (non-fungible tokens). This review should be distinguished from 'Edge computing', which is a computational architecture approach that can underly the distributed internet – this review refers not to the physical infrastructure but to the protocols and distributed control of data processing under 'web3'.it should be noted that the growth in edge computing is not dependent on the potential rise of web3 although the two are related.

Overview

Web3 is being developed through a combination of decentralised technologies such as blockchain, peer-to-peer networking, and cryptographic protocols. These technologies allow for the creation of decentralised applications (dApps) and platforms that are not controlled by any single entity, but rather operate on a decentralised network of computers. For proponents of web3, the drivers are increased privacy and security, reduced censorship, and the potential for more equitable business models – however, the realisation of these benefits are by no means certain. The primary barriers to web3 roll out are adoption (it is not clear at present how widely users will want to take up and use web3), the early stage of development of the associated infrastructure, cybersecurity risks, and barriers to scalability (including cost and speed of transactions). Decentralised internet does not pose direct physical risks to users, but could pose significant regulatory challenges, with a lack of clarity around how they could be regulated and the impact they will have for example on online marketplaces, which may be challenging to monitor.

Summary of time to market

The TRL of web3 is relatively low, as it is still in the early stages of development and implementation. While some web3-related technologies, such as blockchain, have reached a higher level of maturity, the overall development of the Web3 ecosystem is still in its infancy. Web3 relies on a cluster of different technologies and physical infrastructures, and is being developed through a variety of areas from NFTs to decentralised finance. Robust interfaces and infrastructures would be required to develop decentralised internet beyond technologies with large amounts of attention at present.

Summary of scale and ubiquity

There is limited information available about the specific market size of Web 3.0 at present, although market reports reviewed speculate a rapid growth in market size and revenue to 2030. Web 3.0 does not relate directly to emerging products, but may become increasingly ubiquitous in online transactions and marketplaces as new platforms emerge that offer usable ways for people to interact with decentralised internet. Two prominent web3 platforms, Decentraland and The Sandbox, both popular web3 virtual spaces, have a combined current market value of around $1.5 billion. However, web3 is at an early stage of development and the degree to which it will be realised in the near future is highly uncertain.

Summary of relevance to OPSS

The primary impact of decentralised internet in relation to OPSS is around its impact on online marketplaces and the regulation and monitoring of the sale of goods. A fundamental tenant of web3 is decentralisation, allowing buyers and sellers for example to interact and transact directly without intermediaries. It could also have potential application in management of supply chains. Web3 also enables ownership of digital assets (non-fungible tokens, or NFT, being a prominent example of this) and micropayments.

Estimated market size (USD)	Estimated CAGR	Technology readiness level	Level of Harm (/5)
Combined value of 2 prominent web3 platforms: $1.43 billion	Web 3.0: 43.7%, Web 3.0 blockchain market: 47.1%	3	1

Communications and digital
Decentralised internet

Summary of potential harms and benefits

Decentralised internet poses no direct physical risks to users as it is a software-based technology. However, as decentralised internet facilitates peer-to-peer commerce, it may pose some associated risks with the sale of unregulated goods. However, web3 can also allow increased transparency and tracking for e-commerce transactions – for example, the use of smart contracts on a blockchain can enforce the terms of a transaction and provide a tamper-proof record of the transaction, which can make it more difficult to engage in illegal or unsafe activities.

Summary of non-physical risks

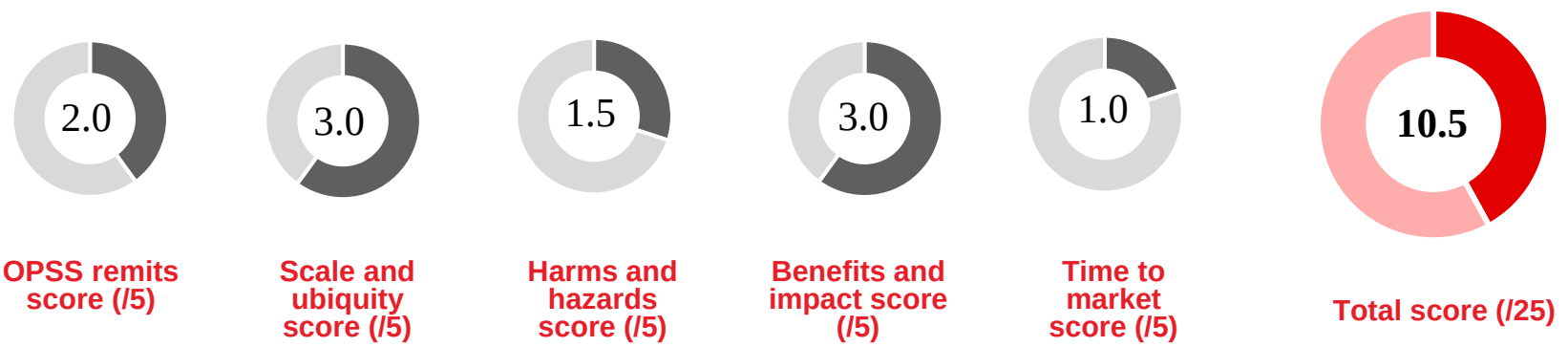
Decentralised internet would have significant impact on cybersecurity, as it reduces reliance on centralised data servers which are often the target of cyberattack, but provides more avenues for cyberattack, making it harder to secure a whole network. Similarly for data privacy, web3 has both potential harms and potential benefits, as users would have greater control over their data, but the regulation and oversight over how it is used would be more difficult. Online wellbeing could be compromised in spaces which are less regulated and controlled (for example, related to cyberbullying). As decentralised internet facilitates peer-to-peer commerce, it may pose some associated risks with selling of unregulated goods. Vulnerabilities and bugs can lead to the theft of funds, their freezing, or even the destruction of the smart contract. On the other hand, web3 can also allow increased transparency and tracking for e-commerce transactions. For example, the use of smart contracts on a blockchain can enforce the terms of a transaction and provide a tamper-proof record of the transaction, which can make it more challenging to engage in illegal or unsafe activities. Due to the permanent nature of blockchain transactions, it is crucial to prioritse having the security of smart contract code in place.

Summary of macro-scale impacts

Decentralised internet relates to the future of the internet as a whole, which has potential impacts across social, economic, and political domains. However, it is difficult to say at present that the scale of this impact will be large, as decentralised internet is at a relatively early stage of development and the scale of uptake is not yet known. One application of web3 could be to provide a decentralised and transparent platform for tracking the movement of goods, and for managing logistics. Similarly, decentralised internet is likely to have impact in the retail space, providing new avenues and approaches to e-commerce and peer-to-peer transactions.

Potential types of hazards

Non-physical



Communications and digital
Decentralised internet

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