

# WISDOM

Strategically Chaotic.



# HACKDSC'21

**WiSDOM** is Dynamic Data Obfuscation Module, a project submitted by team “**TheArchitect**” under **Open Innovation** category to tackle data privacy and security issues over insecure/compromised communication channel or storage.

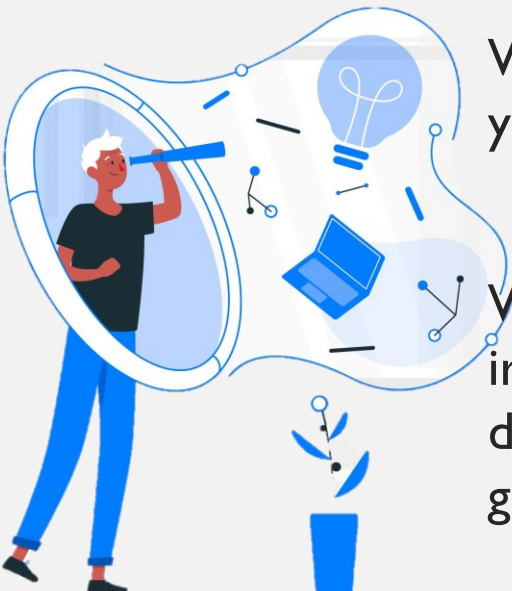


# OPEN AND INNOVATIVE

Not following traditional methods can be difficult, but challenges help us conjure up radical ideas, something out of the box, controversial yet effective.

WiSDOM does not follow any conventional method for data obfuscation yet adheres to core concepts of cybersecurity and data privacy.

We understand the importance of a tech that is easy to understand irrespective of how complex the internal design is, hence we've created a dedicated scenario, a web app integrated with our WiSDOM module to give a feel of it at <https://wisdomdemo.herokuapp.com/>



## DATA. PRIVACY.

“Privacy is what allows us to determine who we are and who we want to be.”

–Edward Snowden, ex-NSA/CIA

Our problem is that we don't have enough new and radical data security tactics, so our statement is to provide one to the community.

## SECURITY OF COMMONLY USED DATA TRANSFER PROTOCOLS

- HTTPS - Widely considered a secure transmission protocol it is in fact susceptible to Man in the middle attacks via malicious certificate injection.
- HTTP – Despite widespread use of HTTPS about 49.94% websites still use the less secure HTTP. Clear text data transmission.
- FTP - It is an insecure protocol that relies on clear-text usernames and passwords for authentication and is susceptible to sniffing, spoofing and brute force attacks.
- TELNET – It is inherently insecure due to lack of encryption of transmissions.

# FEATURES



Dynamic Data Obfuscation



Infinite Permutations

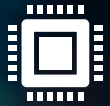


No specific trace left behind





Straight forward Integration



In-Memory Execution



Cross Platform Deployment

FEATURES

## DATA. PRIVACY.

WiSDOM is a dynamic data obfuscation module which takes your sensitive data and converts it into a work of literature.

This means that even if your data is intercepted the original content will be secure and the attacker will see something else altogether.

You can **disguise your Bank Account details as a chapter from Harry Potter** and no one would be the wiser.

Even if your sensitive data is intercepted chances are that it will be ignored due to its innocuous appearance.





## MORE ON IT

- WiSDOM can obfuscate any **plaintext/data structure/ binary data** (<1MB) into **infinite** combinations of random data for transmission over insecure internet protocols like HTTP, TELNET and FTP. This **can also be extended to store data in databases** where heavy encryption algorithms cannot be implemented due to resource constraints.
- It is based on **WriterScript**, an **opensource esoteric programming language**. and uses it's capabilities and strategy to convert data into writerscript code on the go for covert transmission over internet.



# DEVELOPMENT



Python 3.7

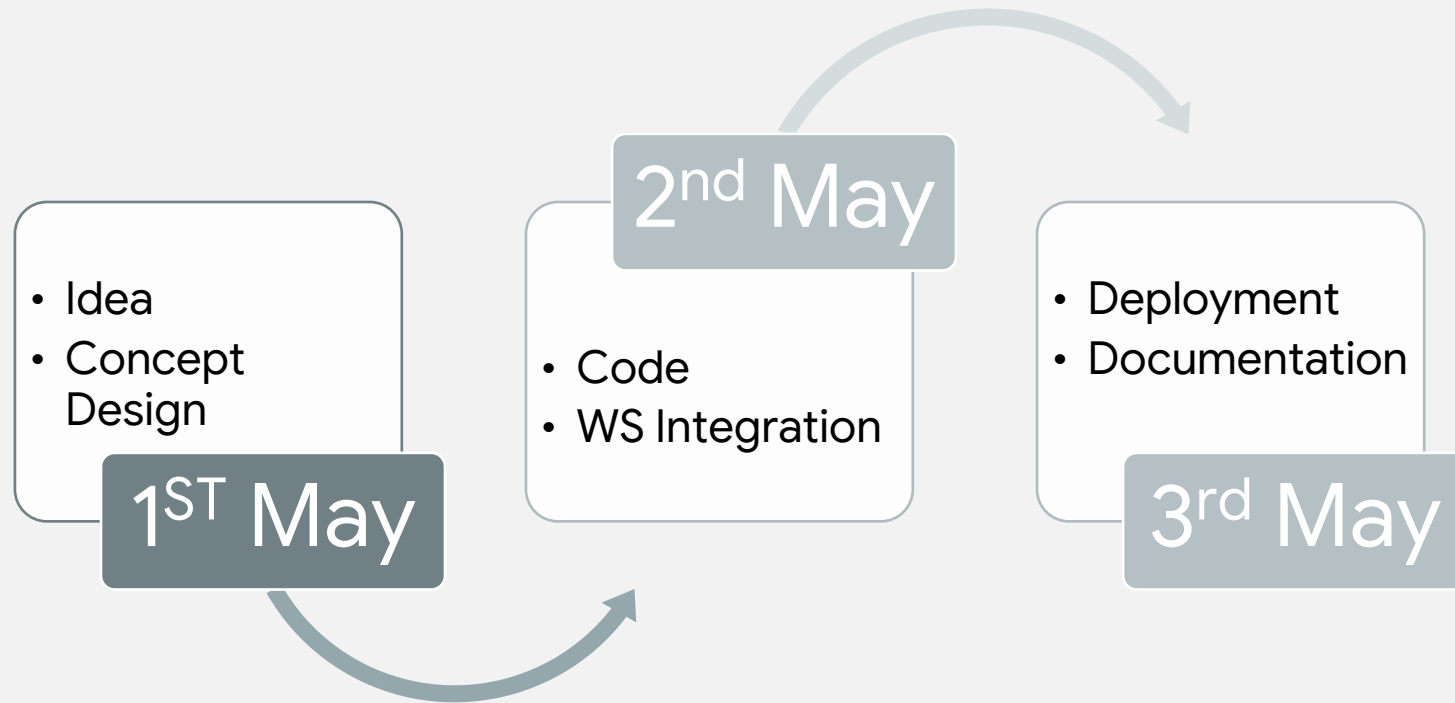


Flask API

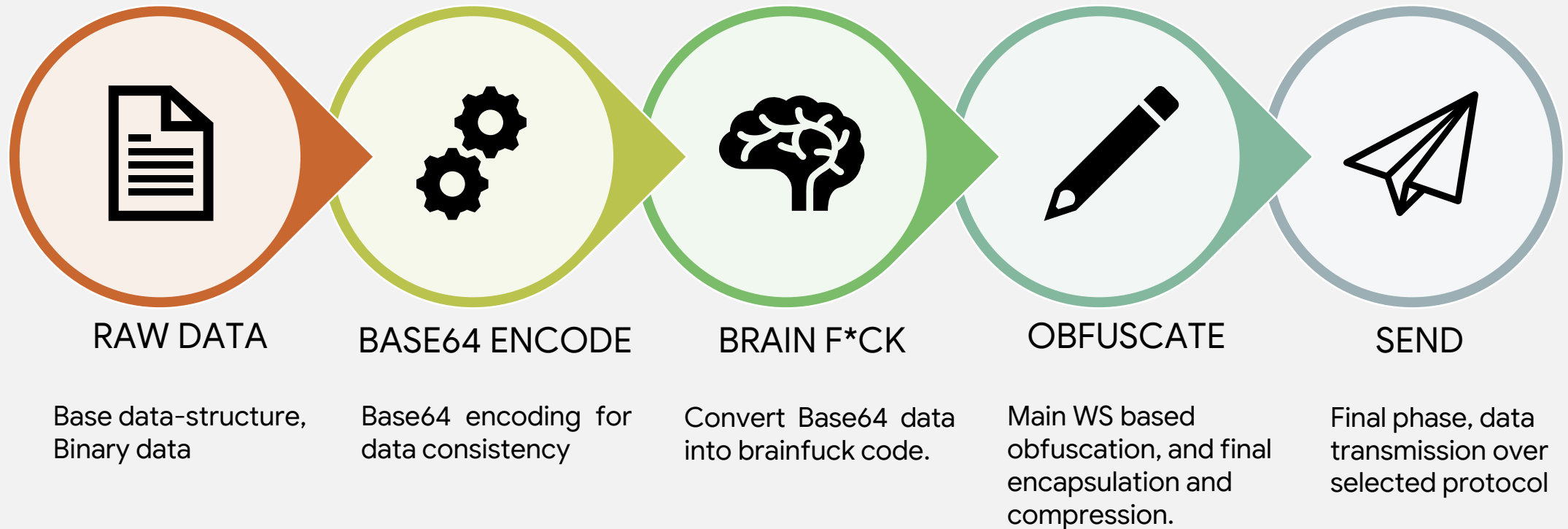


HTML5 / CSS / JS

# TIMELINE



## HOW IT WORKS?





## TECHNICAL DETAILS

```
    if (item = el->FirstChildElement("groupdesc"))
    {
        GroupDesc::ElementDesc elDesc;

        elDesc.sp_name = item->Attribute("name");
        elDesc.spriteName = item->Attribute("spriteName");

        float x = boost::lexical_cast<float>(item->Attribute("x"));
        float y = boost::lexical_cast<float>(item->Attribute("y"));
        float offset = boost::lexical_cast<float>(item->Attribute("offset"));
        unsigned layer = 50; // default
        if ( item->Attribute( "layer" ) != NULL )
        {
            layer = boost::lexical_cast<unsigned>(item->Attribute("layer"));
        }

        elDesc.name_ = sp_name;
        elDesc.spriteName_ = spriteName;
        elDesc.x_ = x;
```

# WiSDOM : Adaptive Data Obfuscation

2021

A child born today will grow up with no conception of privacy at all. They'll never know what it means to have a private moment to themselves, an unrecorded unanalyzed thought. And that's a problem because privacy matters. Privacy is what allows us to determine who we are and who we want to be.

—Edward Snowden

About

Why WiSDOM?

Credit Card Demo

Comparison



An aerial photograph of a coastal area. On the left, a dense green forest covers a hillside that meets a sandy beach. The beach curves along the edge of a body of water with vibrant turquoise and blue hues. White foam from waves is visible near the shore. The overall scene is a mix of natural greenery, sand, and water.

## ABOUT.

### ADAPTIVE DATA OBFUSCATION STRATEGY.

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WisDOM is a strategic Data Obfuscation Module which takes your sensitive data and converts it into something else. This means that even if your data is intercepted the original content will be secure and the attacker will see something else altogether. You can disguise your Bank Account details as a chapter from Harry Potter and no one would be the wiser. Even if your sensitive data is intercepted chances are that it will be ignored due to its innocuous appearance. With increasing use of cyberspace everything is online and thus accessible to attackers. From Private messages to Financial Details everything can be intercepted online. WisDOM can obfuscate your plaintext/data structure/ binary data (<1MB) into infinite combinations of random data for transmission over insecure internet protocols like HTTP, TELNET and FTP. This can also be extended to store data in databases where heavy encryption algorithms cannot be implemented due to resource constraints.

WisDOM is based on WriterScript, an open-source esoteric programming language. and uses its capabilities and strategy to convert data into writerscript code on the go for transmission over the internet.

## WRITERSCRIPT.

### BEAUTY OF DYNAMIC CODE.

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WriterScript is a word count dependent Esoteric Programming Language



# THE SCENARIO

## OUR MOTIVATION.

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Let's consider the following scenario, Alice and Bob are two netizens just casually communicating over their fav. platform. Mallory is malicious attacker who is listening to the transmission, now there can be one of the two generic cases :-

**1.** Alice and Bob are on insecure protocol like HTTP,FTP or TELNET; All **their data is being sent over in plain text!** so only criteria for Mallory to read their conversation is to know the language they are communicating in.

**2.** The second case can be Alice and Bob are using generic secure protocols like HTTPS, TLS and Certificate signing, but they are on Public internet connection that means that Mallory with some technical knowledge can **inject his certificate** in the communication channel and will be able to effectively convert all the HTTPS data to plaintext, rendering the security of HTTPS and similar protocols ineffective.

A generic observation of digital space around us will easily point out thousands of Alices and Bobs risking their critical information to these scenarios. This is what we want to change, if we cannot encrypt the data with heavy, resource extensive and time consuming cryptographic algorithms then we should make the job for attacker so hard that they will move to easier targets.





## PURE PYTHON3

### LIGHTWEIGHT IN-MEMORY PROCESSING.

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Encoding and encryption may require lots of processing power, as they should when encrypting large data and creating large random numbers.

But NOT when transmitting small data over insecure communication channel on systems with limited capabilities. That's where we will use **WiSDOM**.

## WHEN TO USE WISDOM?

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This is simple, you need secure communication and that extra little peace of mind but cannot afford to use existing cryptographic strategies? **Use WiSDOM.**

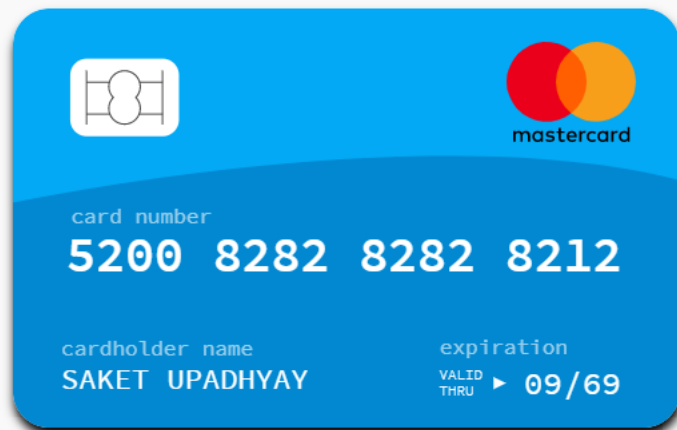
## SIMPLE INTEGRATION

### LEAVE THE HEAVY TASK TO US.

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Integrate **WiSDOM** with your existing APIs effortlessly, just include libraries and pass your data to **wisdom.encode(data)**

# W!SDOM Payment Portal



Name

Saket Upadhyay

Card Number

generate random

5200 8282 8282 8212



Submit

Expiration (mm/yy)

09/69

Security Code

1693



# Data Sent Over W!SDOM Server

## Original JSON Form Data

```
{'name': 'Saket Upadhyay', 'cardno': '5200 8282 8282 8212', 'expdate': '09/69', 'cvv': '1693'}
```

## W!SDOM Form Data

Data information knowledge and wisdom, are closely related concepts but, each has its own role in relation, to the other and each term has its own, meaning According to a common, view data are collected and, analyzed; data only becomes information suitable for making decisions, once it has been analyzed, in some fashion One can, say that the extent to, which a set of data is informative to someone, depends on the extent to, which it is unexpected by, that person The amount of, information contained in a data, stream may be characterized by its Shannon entropy Knowledge, is the understanding based on, extensive experience dealing with information, on a subject For example, the height of Mount Everest, is generally considered data The, height can be measured precisely with an altimeter and, entered into a database This, data may be included in, a book along with other, data on Mount Everest to, describe the mountain in a, manner useful for those who, wish to make a decision about the best method, to climb it An understanding, based on experience climbing mountains, that could advise persons on, the way to reach Mount, Everest's peak may be seen, as "knowledge" The practical climbing, of Mount Everest's peak based, on this knowledge may be seen as "wisdom" In, other words wisdom refers to, the practical application of a, person's knowledge in those circumstances, where good may result Thus, wisdom complements and completes the, series "data" "information" and "knowledge", of increasingly abstract concepts Data, are often assumed to be, the least abstract concept information the next least and, knowledge the most abstract In, this view data becomes information, by interpretation; eg the height, of Mount Everest is generally, considered "data" a book on, Mount Everest geological characteristics may, be considered "information" and a, climber's guidebook containing practical information, on the best way to, reach Mount Everest's peak may be considered "knowledge" "Information", bears a diversity of meanings, that ranges from everyday usage, to technical use This view, however has also been argued, to reverse the way in, which data emerges from information, and information from knowledge Generally, speaking the concept of information, is closely related to notions, of constraint communication control data, form instruction knowledge meaning mental stimulus pattern perception and, representation Beynon-Davies uses the concept, of a sign to differentiate, between data and information; data, are a series of symbols, while information occurs when the, symbols are used to refer, to something Before the development, of computing devices and machines, people had to manually collect, data and impose patterns on, it Since the development of, computing devices and machines these devices can also collect, data In the 2010s computers, are widely used in many, fields to collect data and, sort or process it in, disciplines ranging from marketing analysis, of social services usage by, citizens to scientific research These, patterns in data are seen, as information which can be, used to enhance knowledge These, patterns may be interpreted as, "truth" (though "truth" can be, a subjective concept) and may be authorized as aesthetic, and ethical criteria in some, disciplines or cultures Events that, leave behind perceivable physical or, virtual remains can be traced, back through data Marks are, no longer considered data once, the link between the mark, and observation is broken Mechanical, computing devices are classified according, to the means by which, they represent data An analog, computer represents a datum as, a voltage distance position or, other physical quantity A digital computer represents a piece, of data as a sequence, of symbols drawn from a, fixed alphabet The most common, digital computers use a binary, alphabet that is an alphabet, of two characters typically denoted, "0" and "1" More familiar, representations such as numbers or, letters are then constructed from, the binary alphabet Some special, forms of data are distinguished, A computer program is a, collection of data which can, be interpreted as instructions Most, computer languages make a distinction between programs and the, other data on which programs, operate but in some languages, notably Lisp and similar languages, programs are essentially indistinguishable from, other data It is also, useful to distinguish metadata that, is a description of other, data A similar yet earlier, term for metadata is "ancillary, data" The prototypical example of, metadata is the library catalog, which is a description of, the contents of books In, the early 1940s memory technology, often permitted a capacity of, a few bytes The first electronic programmable digital computer, the ENIAC using thousands of, octal-base radio vacuum tubes could, perform simple calculations involving 20, numbers of ten decimal digits, which were held in the, vacuum tube The next significant, advance in computer memory came, with acoustic delay line memory, developed by J Presper Eckert, in the early 1940s Through, the construction of a glass, tube filled with mercury and, plugged at each end with, a quartz crystal delay lines, could store bits of information, in the form of sound, waves propagating through mercury with the quartz crystals acting, as transducers to read and, write bits Delay line memory, was limited to a capacity, of up to a few, hundred thousand bits to remain, efficient Two alternatives to the, delay line the Williams tube, and Selectron tube originated in, 1946 both using electron beams, in glass tubes as

BY DEVELOPERS,

FOR DIGITAL CITIZENS.



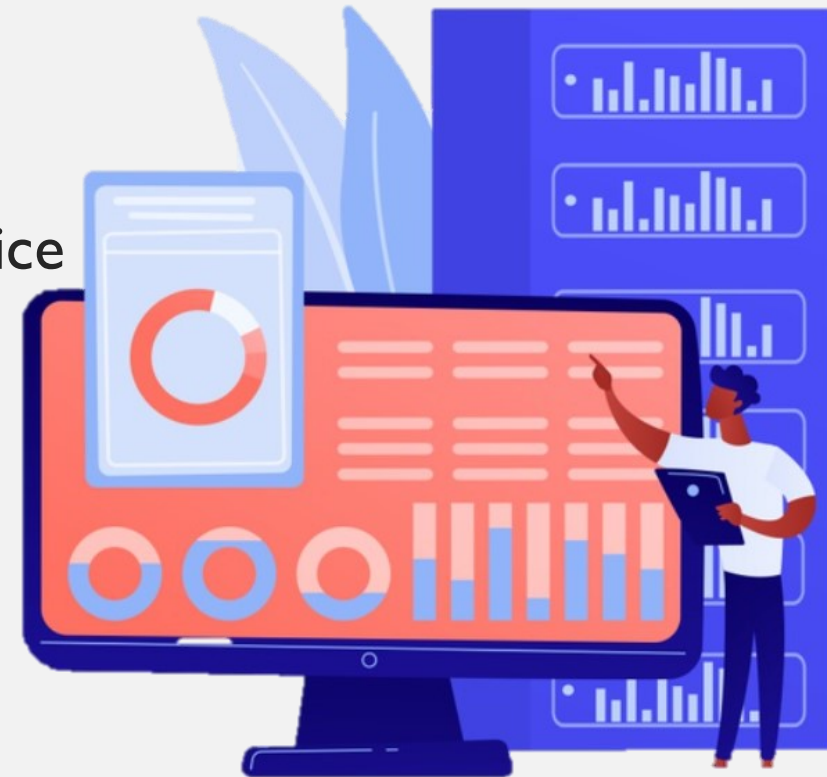


# THE COMMUNITY

- A survey conducted by Reuters showed that more than seven in 10 respondents to a survey of almost **10,000 people across 9 countries** were **worried about how their personal data** was being collected and used.
- In a world of ever-increasing online activity, the common man struggles to protect himself from **Mass Surveillance and Data breaches**. CoVID has only compounded the issue.
- While other secure data transmission and storage tools exist they are resource expensive and complicated to use.
- WiSDOM is easy-to-use open-source alternative.

## FUTURE DEVELOPMENT PLANS

- Module for Obfuscation of Social Media Chats
- Module for Obfuscated data storage in Cloud
- Universal API to use WiSDOM as obfuscation as a service



THANK ▼ YOU

TheArchitect, HackDSC'21

# ACCREDITATION

- All the vector graphics are downloaded from Free Pik under free license.