

Technology in Daily Life:

Disruptive Technologies

Ministry of Transport, Malaysia

About Me...



BLOCKCHAIN • TECHNOLOGIES • CONNECTION

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Disruptive Technologies

What is it?

Disruptive technology is the **technology that affects the normal operation** of a market or an industry. It **displaces a well-established product** or technology, creating a **new industry or market**. A professor at Harvard Business School,

Clayton M. Christensen, invented the term “disruptive technology.”



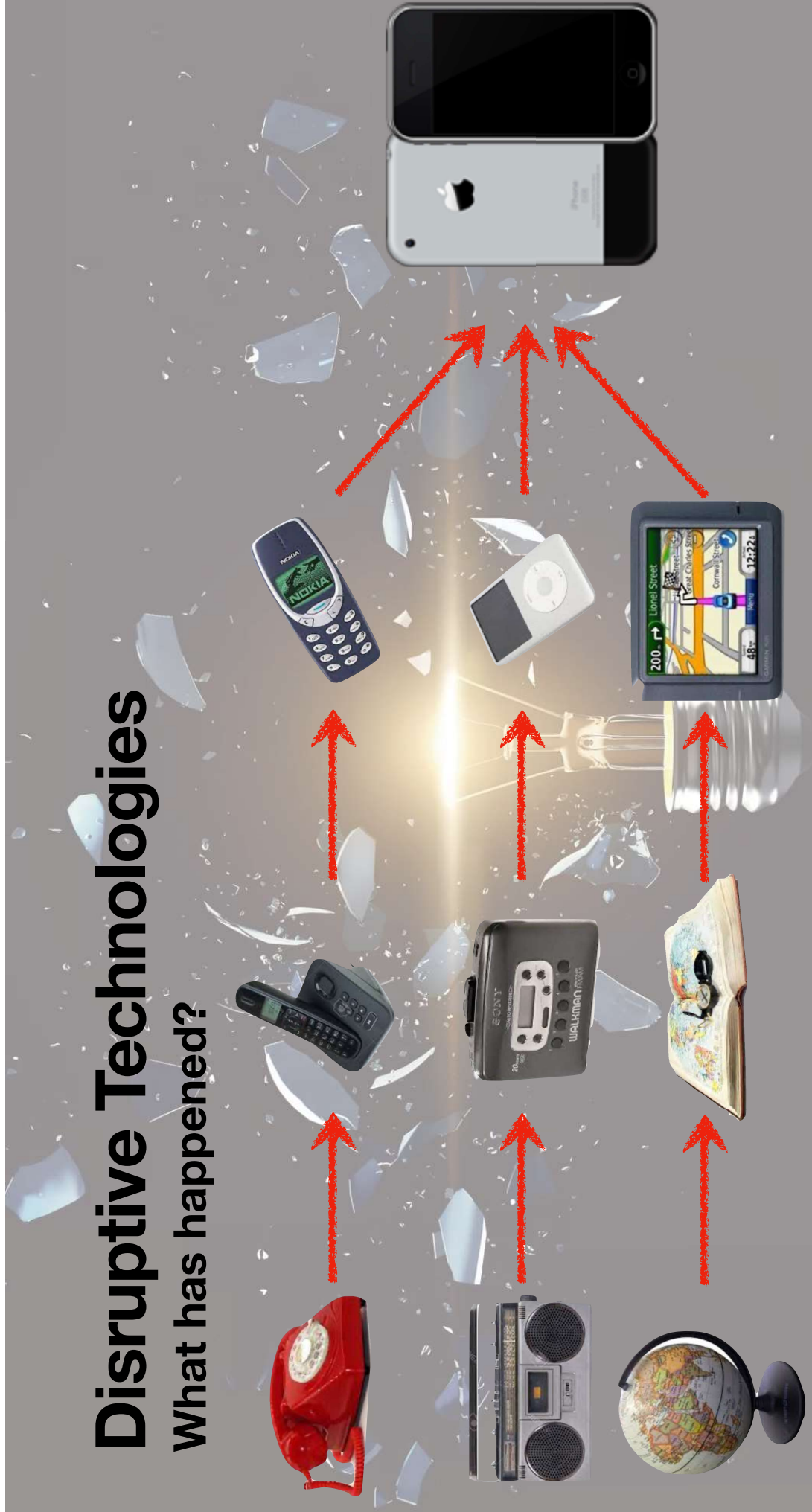
Disruptive Technologies

What has happened?



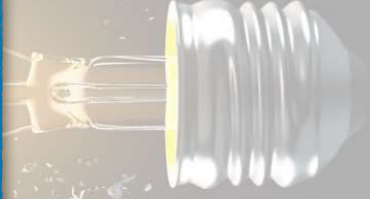
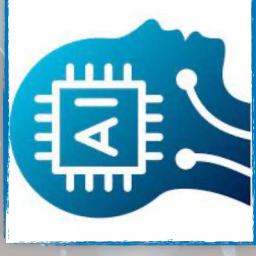
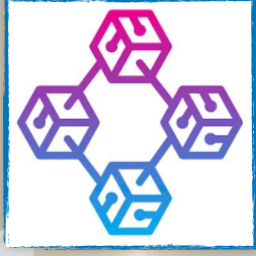
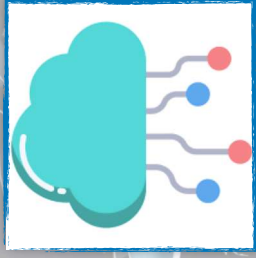
Disruptive Technologies

What has happened?



Disruptive Technologies

Prominent today



Cloud Computing

What is Cloud Computing?

Cloud computing is on-demand access, via the internet, to computing resources—applications, servers (physical servers and virtual servers), data storage, development tools, networking capabilities, and more—hosted at a remote data center managed by a cloud services provider (or CSP). The CSP makes these resources available for a monthly subscription fee or bills them according to usage

On Demand

Via the Internet

Access to
Resources

Hosted Remotely

Billed Monthly or
Usage-based

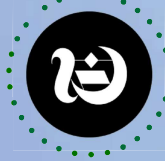
Cloud Computing

Top Benefits of Cloud Computing

- **Lower IT costs:** Cloud lets you offload some or most of the costs and effort of purchasing, installing, configuring, and managing your own on-premises infrastructure.
- **Improve agility and time-to-value:** With cloud, your organization can start using enterprise applications in minutes, instead of waiting weeks or months for IT to respond to a request, purchase and configure supporting hardware, and install software. Cloud also lets you empower certain users—specifically developers and data scientists—to help themselves to software and support infrastructure.
- **Scale more easily and cost-effectively:** Cloud provides elasticity—instead of purchasing excess capacity that sits unused during slow periods, you can scale capacity up and down in response to spikes and dips in traffic. You can also take advantage of your cloud provider's global network to spread your applications closer to users around the world.

Cloud Computing

How well has Cloud been adopted?



The New York Times, through the Aristo system for digital subscription.



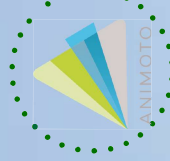
General Electric, which in 2017 decided to host more than 2,000 applications and services in the cloud, helping them to optimize and redirect resources, in what has been one of the company's biggest transformations.



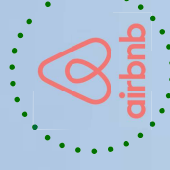
Netflix, which thanks to its cloud migration managed to jump to global success.



Pearson, the multinational educational content company, which thanks to a hybrid cloud infrastructure has managed to redirect resources and focus them on the development of new educational projects.



Animoto Productions, which used cloud computing services to scale its servers, going from 50 to 3,500 in just three days.



Airbnb, a company that, after a year of its launch, and due to problems with its original provider, decided to migrate all its services and functions to AWS, marking the beginning of the success that it currently enjoys.

Cloud Computing

Main Players

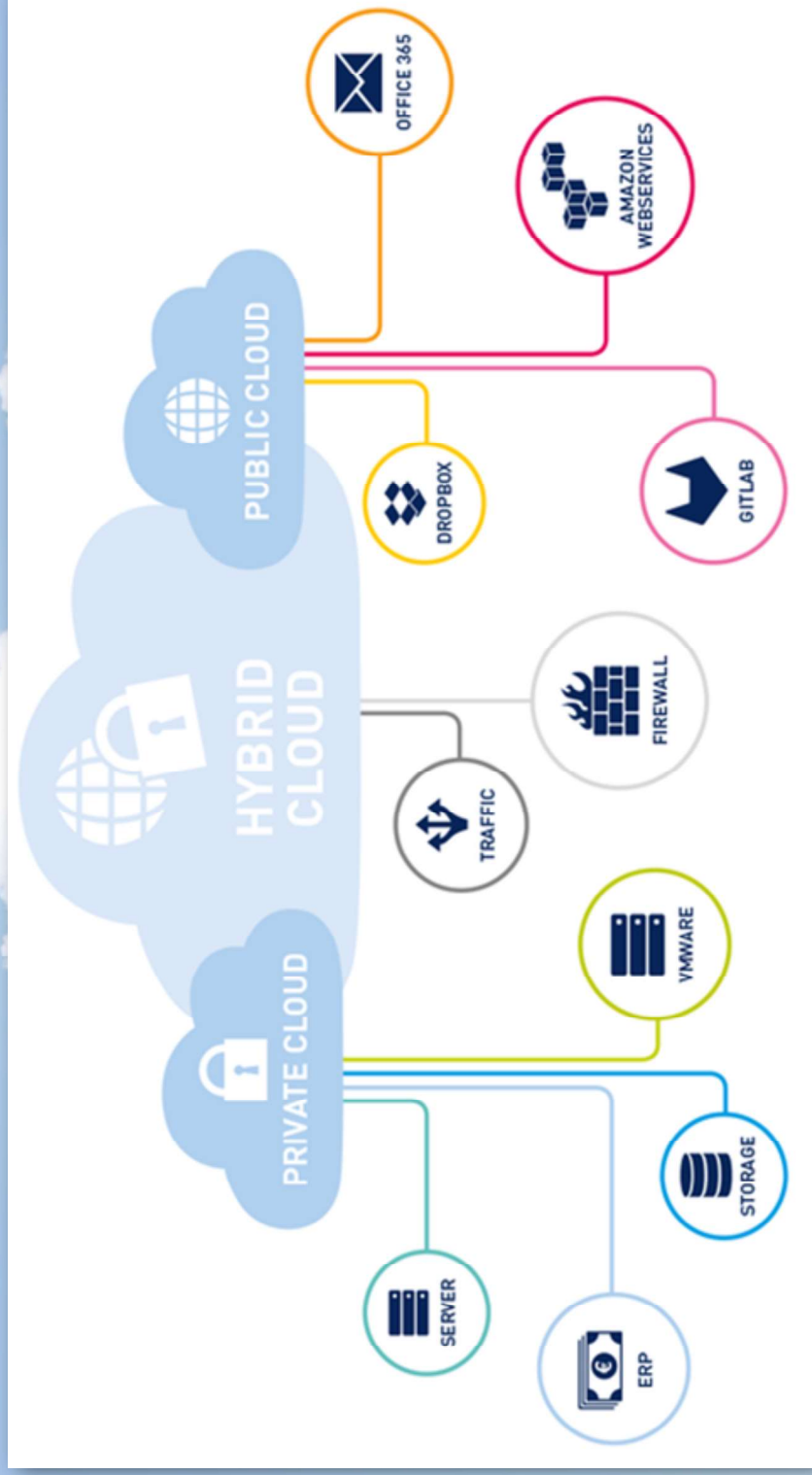


IBM Cloud



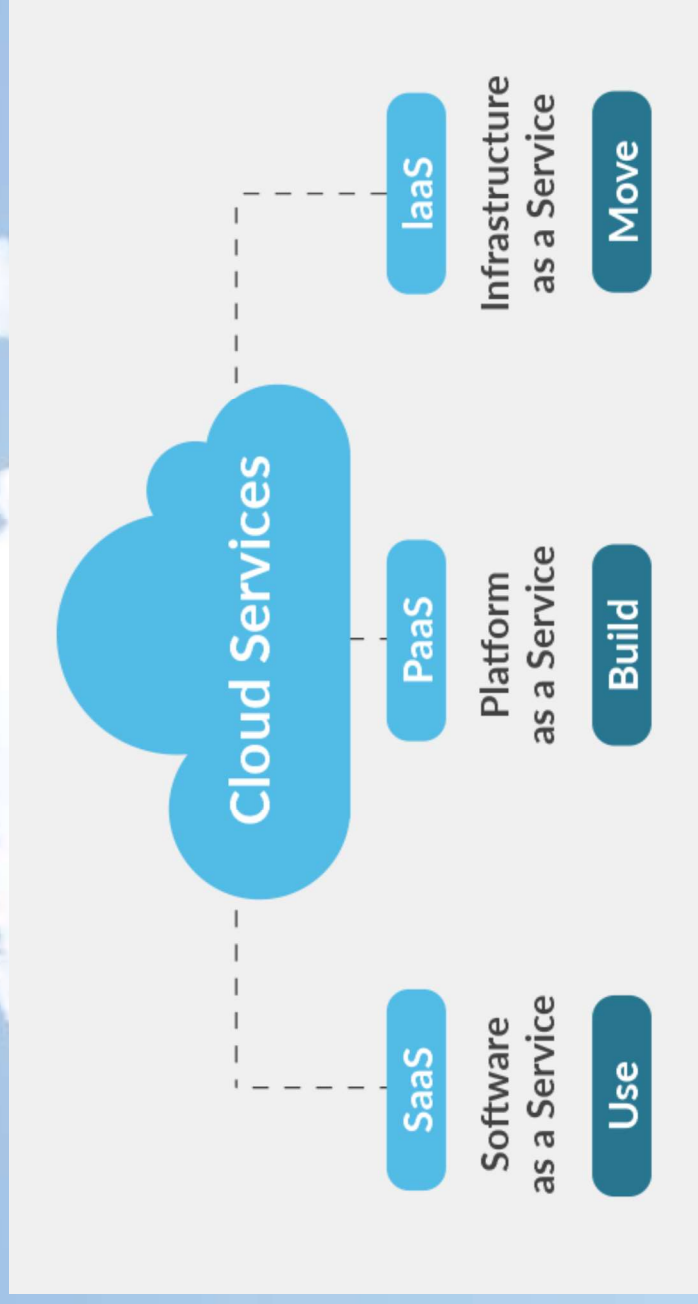
Cloud Computing

Types of Clouds



Cloud Computing

Cloud Services



Cloud Computing

Infrastructure-as-a-Service

IaaS allows organizations to purchase resources like networking and storage on-demand instead of having to buy costly hardware. IaaS is highly scalable and offers businesses more flexibility than on-premise solutions.

IaaS can be seen as the basic layer in cloud computing. The virtualized components available through the internet are equivalent to the servers and hardware companies would traditionally store in their building.

When to use IaaS?

Organizations of all sizes can benefit from IaaS. Small companies who want to avoid purchasing hardware or don't have the time, staff, or ability to host large data centers on-premise, as well as larger businesses who want to stay in control of their apps and only want to consume the resources they actually need. The scalability of IaaS is also great for companies that experience rapid growth.

IaaS benefits

IaaS offers many benefits to companies who want to migrate to the cloud. The most compelling ones are listed below.

- **Flexibility:** IaaS is more flexible than all the other cloud computing models.
- **Automation:** With IaaS, you can easily automate the deployment of servers, storage, and networking.
- **Cost-reduction:** IaaS lets you purchase resources on an as-needed basis, so you only pay for what you're actually using.
- **Control:** IaaS lets you retain complete control of your infrastructure.
- **Scalability:** Since you're only "renting" IT components, you can easily upscale or downscale your resources.

Cloud Computing

Platform-as-a-Service

PaaS is a platform that can be accessed through the internet provides developers with a framework and tools to build apps and software that are tailored to the organization's individual needs.

PaaS can be seen as a scaled-down version of IaaS. Just like IaaS, the customers have access to servers and data centers which are maintained and managed by the third-party provider. However, they mainly use PaaS for building custom SaaS applications.

When to use PaaS?

There are several situations when a Platform-as-a-Service would be a good idea. For example, if you have several developers working on the same development project, PaaS is a great way to streamline workflows.

You can even include other vendors and stay flexible during the entire process. PaaS is also the way to go if your organization requires customized applications that need to be developed and deployed in a short amount of time.

PaaS benefits

Below are a few of the biggest benefits that speak for adopting PaaS as a cloud computing model.

- **Cost-reduction:** PaaS is a simple, cost-effective way to quickly develop and deploy new apps.
- **Scalability:** PaaS service models can easily be adjusted to a developer's needs.
- **Migration:** With PaaS, it's easy to migrate to a hybrid cloud model.
- **Less coding:** Your developer teams have to do a lot less coding than before.
- **Freedom:** PaaS frees up time as developers can customize apps without having to maintain the software.

Cloud Computing

Software-as-a-Service

These entire cloud application services are the most common form of cloud computing. They are ready-to-use and often run directly through the client's web browser, meaning there is no need for installations or downloads like it with on-prem solutions.

SaaS is hosted on remote servers and fully managed, updated, and maintained by a third-party vendor. This results in less responsibility but also less control for the end-user.

When to use SaaS?

SaaS is ideal for small companies or startups that don't have the capacity to develop their own software applications. From e-commerce to short-term projects, SaaS is the quickest and easiest solution if you don't need highly customized applications. SaaS is also a great option for applications that are not used very often, e.g. tax software.

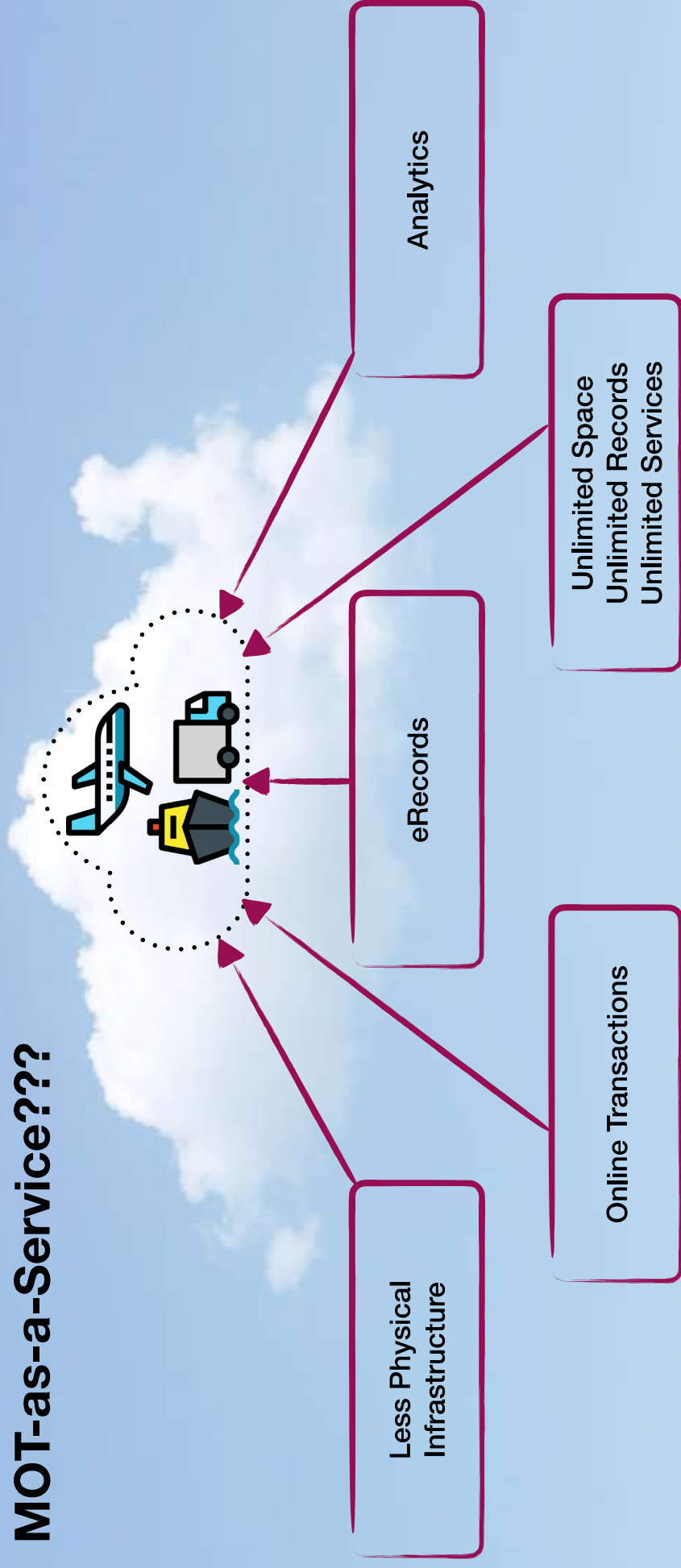
SaaS benefits

Software-as-a-Service provides several advantages to businesses and their teams.

- **Cost-reduction:** SaaS usually resides in a shared or multi-tenant environment. When managed correctly, the license costs are lower compared to traditional models.
- **Scalability:** SaaS solutions are easy to scale up or down based on your specific needs.
- **Integration:** Many SaaS solutions have integrations with other SaaS offerings, so you don't have to buy another server or software.
- **Upgrades:** With SaaS, you instantly benefit from new software releases and upgrades.
- **Ease of use:** Without installation or download, SaaS is easy to use and comes with baked-in best practices.

Cloud Computing

MOT-as-a-Service???



Blockchain

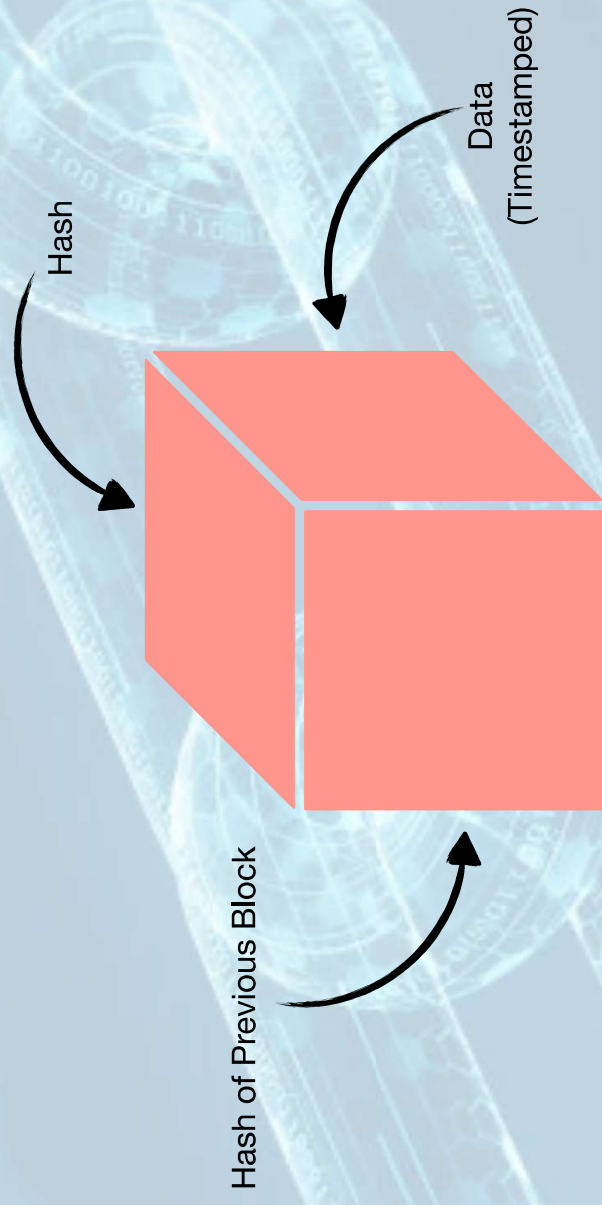
What is Blockchain?

Blockchain is a **shared, immutable ledger** that facilitates the process of **recording transactions** and **tracking assets** in a business network.

An *asset* can be tangible (a house, car, cash, land) or intangible (intellectual property, patents, copyrights, branding). Virtually anything of value can be tracked and traded on a blockchain network, **reducing risk** and **cutting costs** for all involved.

Blockchain

How does Blockchain Work?



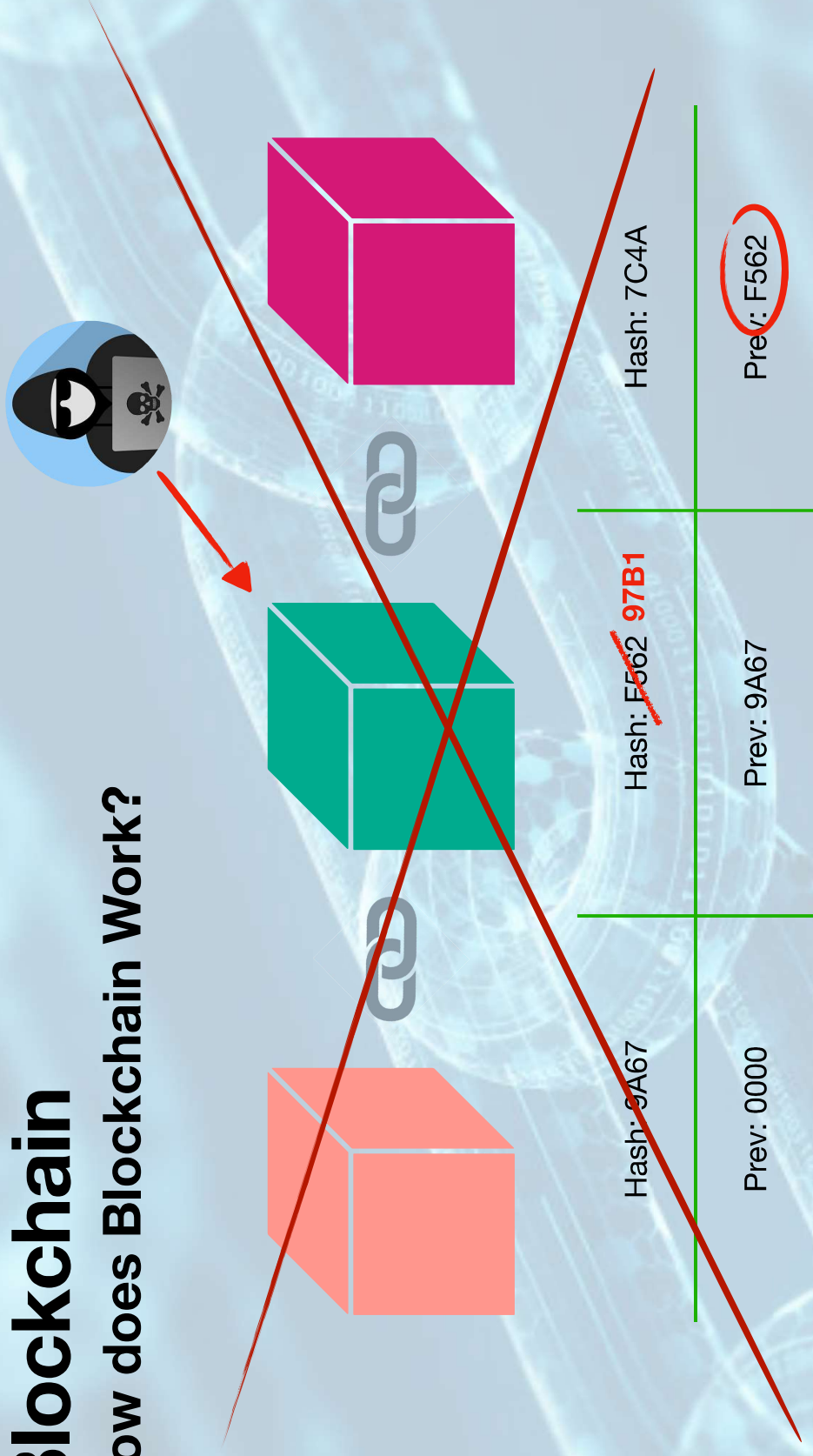
Blockchain

How does Blockchain Work?



Blockchain

How does Blockchain Work?



Blockchain

Key Elements



Distributed ledger technology

All network participants have access to the distributed ledger and its immutable record of transactions. With this shared ledger, transactions are recorded only once, eliminating the duplication of effort that's typical of traditional business networks.



Immutable records

No participant can change or tamper with a transaction after it's been recorded to the shared ledger. If a transaction record includes an error, a new transaction must be added to reverse the error, and both transactions are then visible.

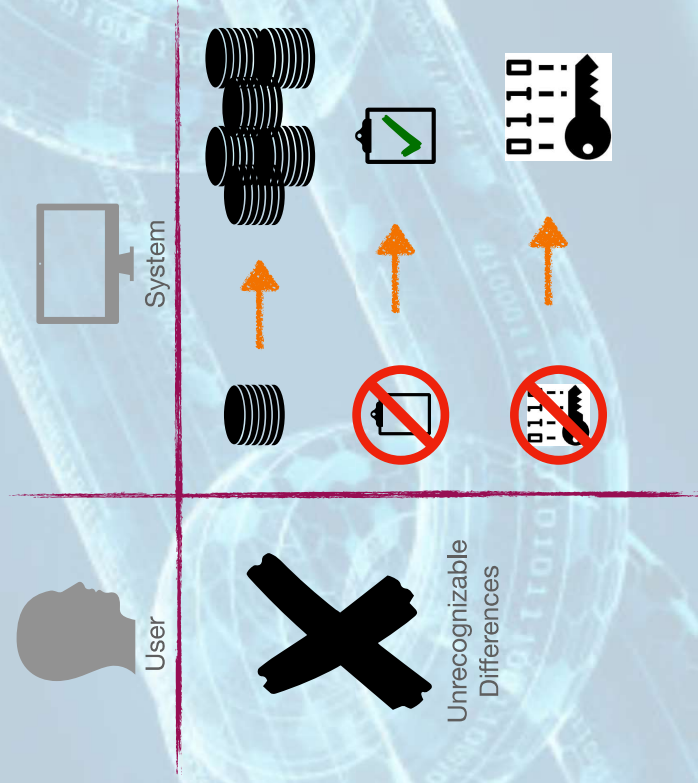


Smart contracts

To speed transactions, a set of rules — called a smart contract — is stored on the blockchain and executed automatically. A smart contract can define conditions for corporate bond transfers, include terms for travel insurance to be paid and much more.

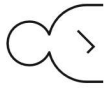
Blockchain

Traditional vs Blockchain



Blockchain

Benefits of Blockchain



Greater trust

With blockchain, as a member of a members-only network, you can rest assured that you are receiving accurate and timely data, and that your confidential blockchain records will be shared only with network members to whom you have specifically granted access.



Greater security

Consensus on data accuracy is required from all network members, and all validated transactions are immutable because they are recorded permanently. No one, not even a system administrator, can delete a transaction.



More efficiencies

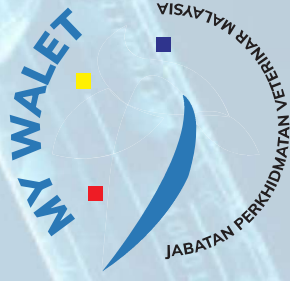
With a distributed ledger that is shared among members of a network, time-wasting record reconciliations are eliminated. And to speed transactions, a set of rules — called a smart contract — can be stored on the blockchain and executed automatically.

Blockchain

Major Success Stories



سداد دبي
dubaipay



Blockchain

Future of Blockchain

HEALTHCARE

Financial Institutions

GOVERNMENT

Digital Coin

Cybersecurity

Ministry of Transport?

Artificial Intelligence

What is AI?

Artificial intelligence (AI) involves using computers to do things that traditionally require human intelligence.

AI can process large amounts of data in ways that humans cannot. The goal for AI is to be able to do things like recognize patterns, make decisions, and judge like humans. To do this, we need lots of data inputted into them.

AI is at the very foundations of some things, like image recognition and classification. It's also changing how we make decisions - for example, it can be used to predict traffic light systems or when you get your coffee in the morning.

Artificial Intelligence

What people think of AI?



When people are asked about AI, they're usually thinking of Hollywood blockbusters like Terminator.

It's not surprising when talking to someone who has never heard nor seen any mention about Artificial Intelligence before (AI) often conjure up images similar to those found within movies such as The Terminator- something which most might consider an accurate representation though.

They think we are at a point where AI can do all things for us - take care of our jobs, make decisions without consulting with humans and so forth.

Artificial Intelligence

What is Machine Learning?

Machine Learning (ML) is a subset of Artificial Intelligence and is a science of getting computers to learn and act as humans do.

In **traditional programming**, a computer is given input data and an algorithm to then produce output.

If a computer is given input data with the corresponding output data so it can learn the algorithm itself and, therefore, continue to predict the right output data, it is called **supervised learning**.

Alternatively, if a computer is given a complex set of input data with no corresponding output data. The machine identifies the relationships in the data to provide valuable insights for decision makers, it is called **unsupervised learning**.

Artificial Intelligence

Why is ML a big deal?

The advent of machine learning has made programming easier. Before this, programmers had to write instructions for the computer to follow.

But if there was a variable that was not on the instructions, it would stop working. The problem is that technology is used in different ways. There are so many possible things to write rules for that it's not possible.

To use machine learning, programmers can give a few basic suggestions for the base rule and then let machines learn from possibilities.

Driverless cars are a good example. People don't need to write out instructions for how to deal with every possible thing that could happen involving a pedestrian. Instead, they can teach the car not to hit pedestrians and provide it with millions of pictures of pedestrians walking near roads. This will help the car know what it needs to do when it "sees" something similar in the future.

Artificial Intelligence

What is Generative AI?



Generative AI can learn from existing artifacts to generate new, realistic artifacts (at scale) that reflect the characteristics of the training data but don't repeat it. It can produce a variety of novel content, such as images, video, music, speech, text, software code and product designs.

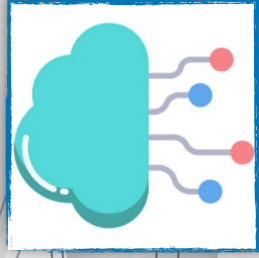
Generative AI uses a number of techniques that continue to evolve. Foremost are AI foundation models, which are trained on a broad set of unlabeled data that can be used for different tasks, with additional fine-tuning. Complex math and enormous computing power are required to create these trained models, but they are, in essence, prediction algorithms.

Artificial Intelligence

The future of Government?

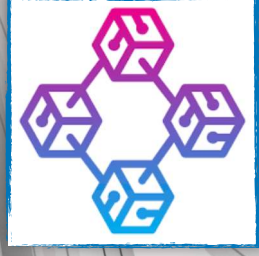


The Future of MOT?



CLOUD INFRASTRUCTURE

Limitless Services
24/7 Availability
Scalable on Demand
Multi Platform - Web, Mobile, Wearables



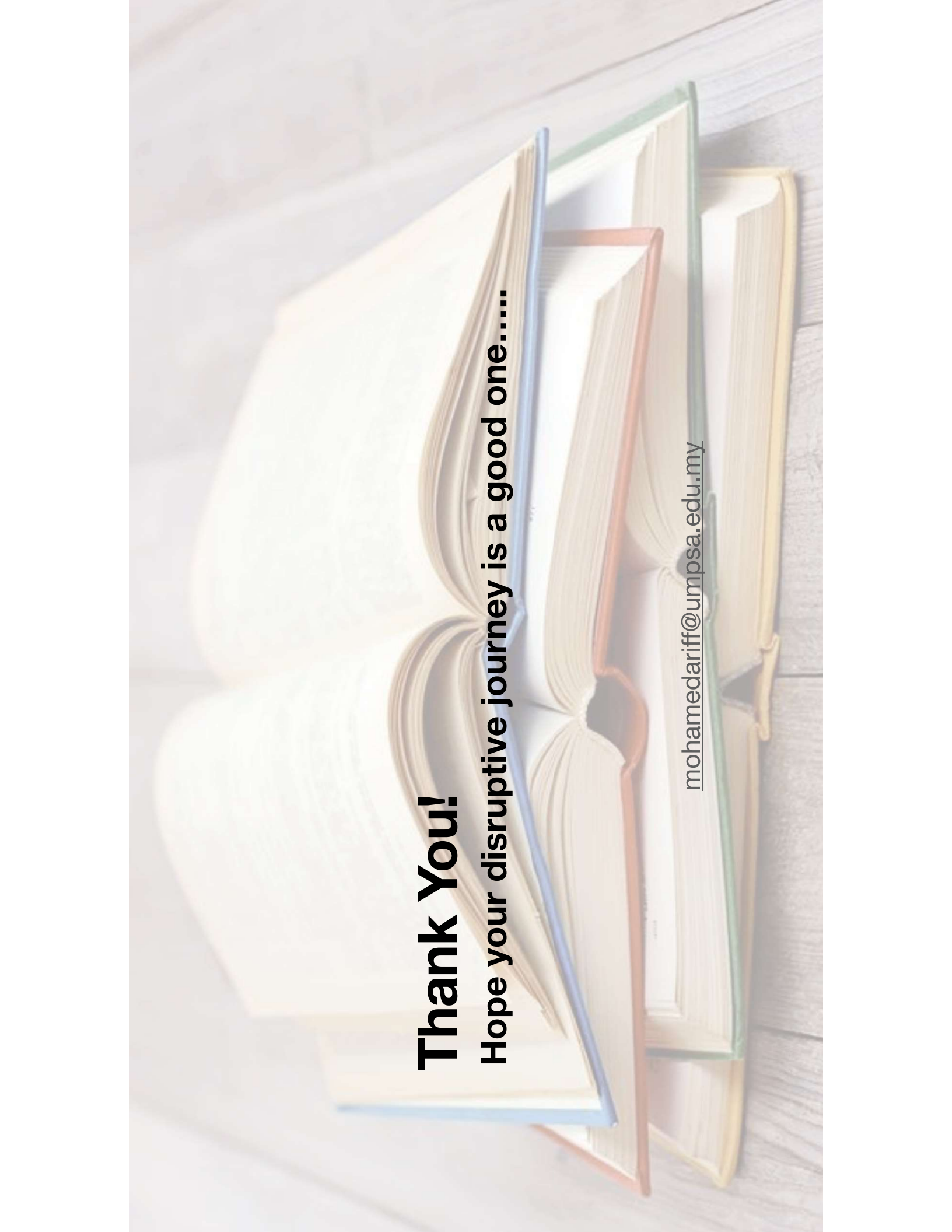
BLOCKCHAIN

Secure
One ID For Every Service
Accountability - Trustworthy
Digital Records



ARTIFICIAL INTELLIGENCE

Reduce Human Interactions
Predictive Algorithms
AI Driven Day-to-day Process
Generative AI and Chatbot



Thank You!

Hope your disruptive journey is a good one.....

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