

**Applying Blockchain technology in
the Post-pandemic era :
The development of on-line contract
signing and logging in Taiwan**

Dr. Simon, C. Y. Chen



Before the Pandemic: The Tsunami of new-tech Is going to strike the real estate industry



According to the C.E.O. of JLL, Anthony Couse
「The real estate industry is undergoing an unprecedented speed of merging into the cutting-edge technology such as AI, VR, IoT, and Blockchain. This implies that the fundamental change of the ways in doing real estate investment, leasing, and transaction is coming soon.

This report also revealed that in Asia the speed may be faster due to there has more younger generations and mobile first is the general routine in these society and markets.

After the pandemic : the impact has been enlarged

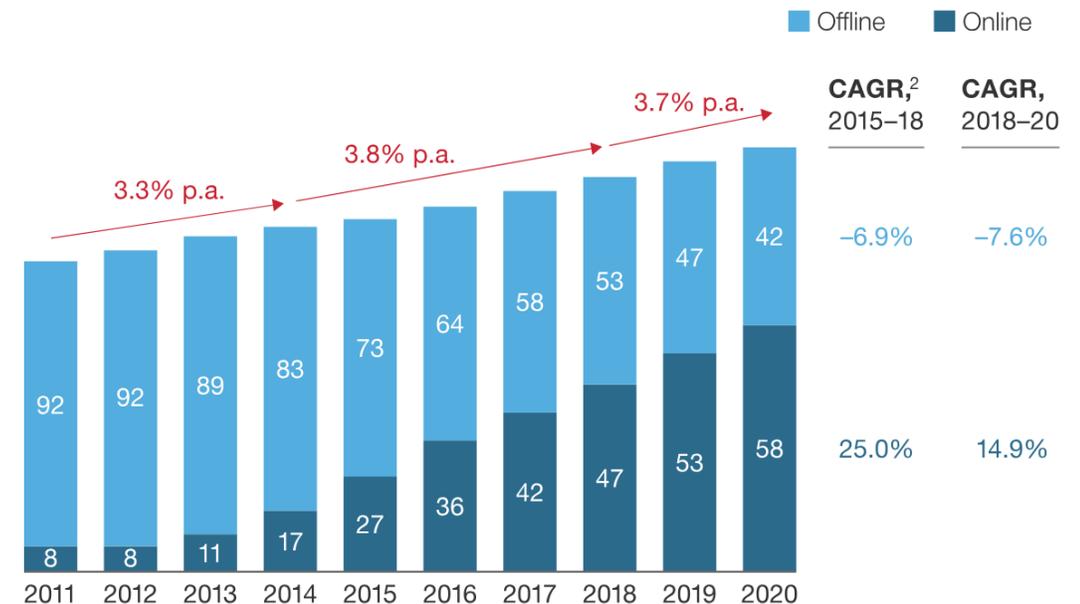


Uber Eats & Foodpanda

2021/7/6

The food-delivery market has the potential for robust growth.

Total addressable classic food-delivery market,¹ %



¹For selected countries only.

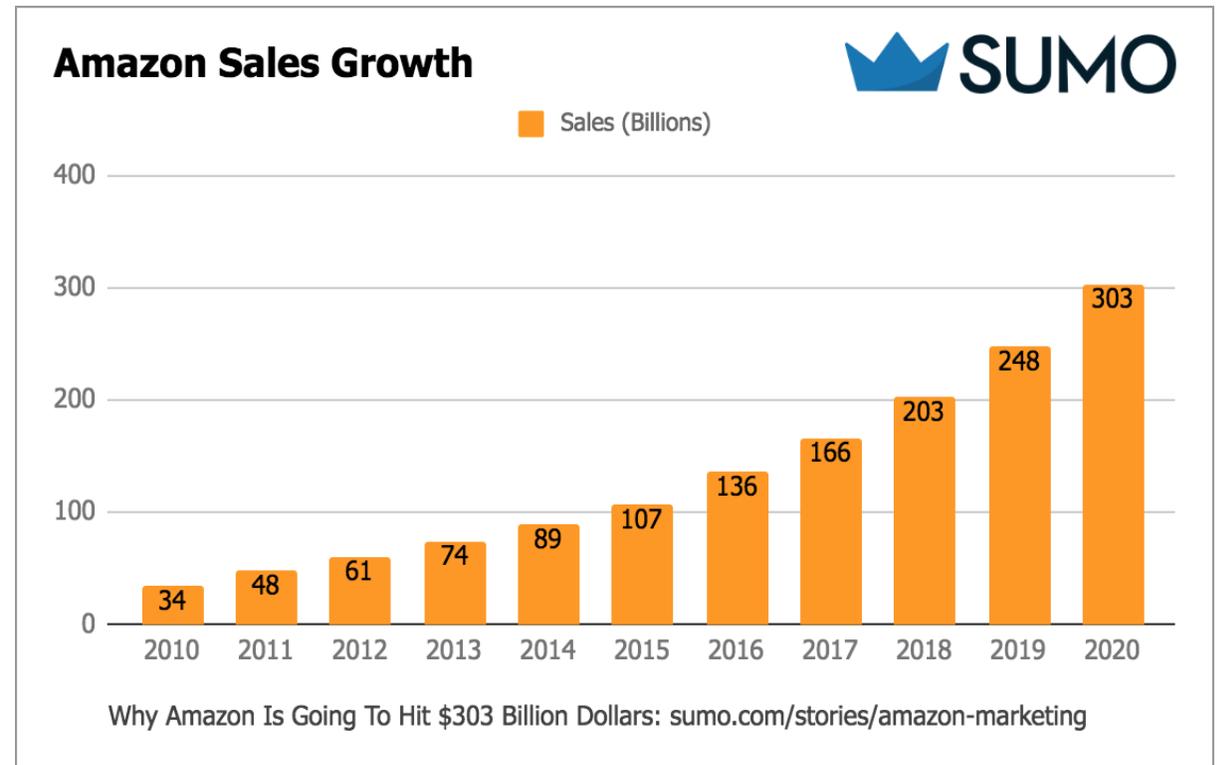
²Compound annual growth rate.

The Amazon is growing much faster

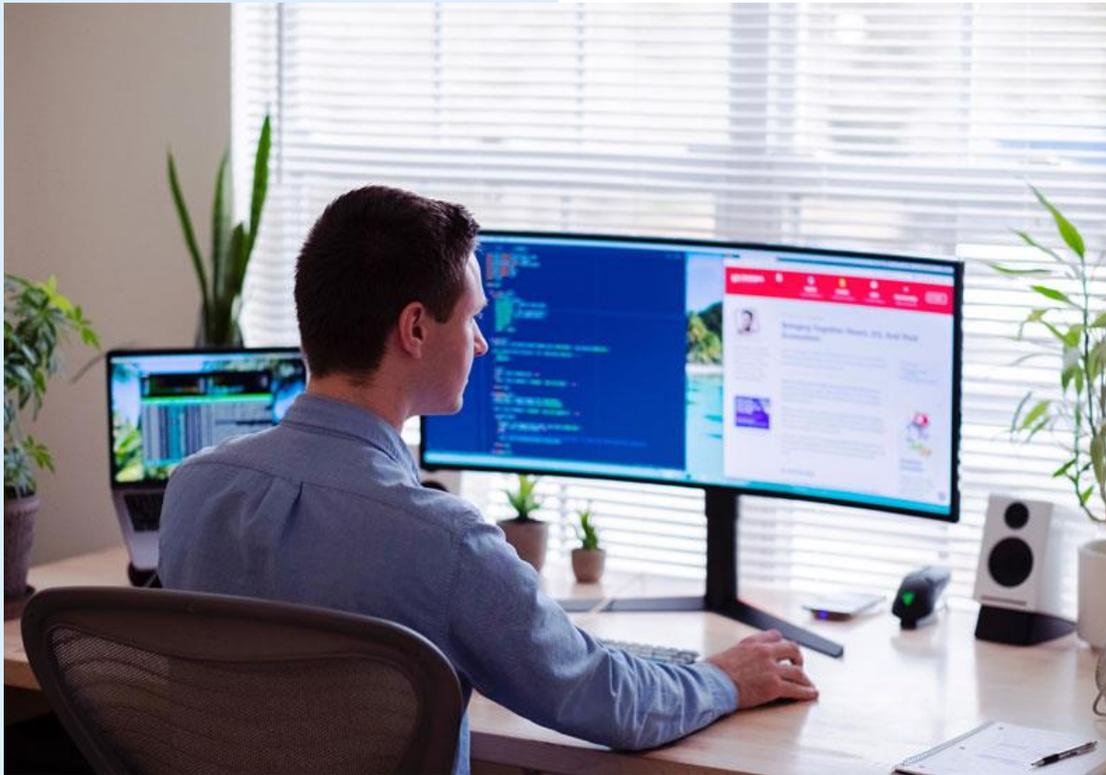


FBA

2021/7/6

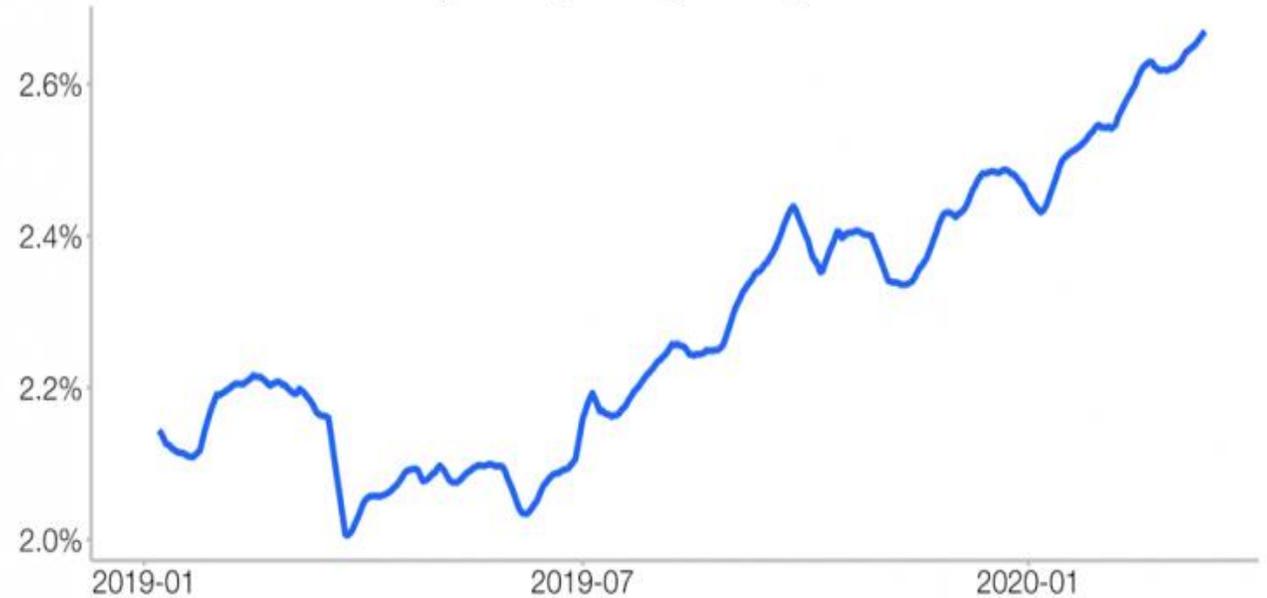


The remote working is becoming a new normal



remote working

Jobs advertising flexible working arrangements are up
Percent of job postings with terms like 'work from home' or 'remote'
7 day moving average through March 14



Whither should the culture of seals in East Asia go?

疫情強碰傳統文化！日本數位轉型最大障礙竟然是印章？

2020.09.28 by T客邦 T客邦 作者簡介



In 2020/6/19, Japan government has decided to abolish the usage of seals in contract signing to prevent the unnecessary occasions of people physical contact.

China also decided to abolish the seals to represent the company entity in 2020.



**What is the blockchain?
and how blockchain can
substitute the seals?**

The key elements of Blockchain



References: David Furlonger, Christophe Uzureau (2019)



Encryption

Blockchain uses technologies such as public and private keys to record the data in the blocks securely and semi-anonymously (participants have pseudonyms).

The participants can control their personal identity and other information and share only what they need to in a transaction.

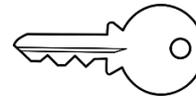
Asymmetrical Encryption : Public /Private Keys

Symmetrical Encryption

Shares one private Key

明文: I owe you

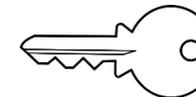
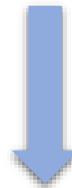
加密



密文:

e5yzHo9I3z8Apw

解密



明文: I owe you

Asymmetrical Encryption

Use public and private Keys

明文: I owe you

加密



公鑰(或私鑰)



密文:

e5yzHo9I3z8Apw

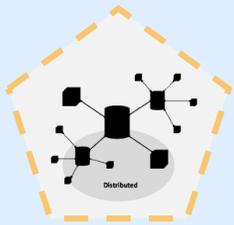
解密



私鑰(或公鑰)



明文: I owe you



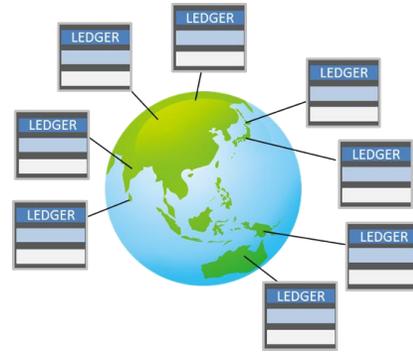
Distribution

A **distributed ledger** (also called a shared ledger or distributed ledger technology or DLT) is a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions. Unlike with a distributed database, there is no central administrator.

In some cases an alternative term is used: RJT for Replicated Journal Technology, since the information is replicated in the nodes containing full copy of the information and the information in the blocks is included in timely order, more in the form of an accounting journal than as an accounting ledger.

A **peer-to-peer** network is required as well as **consensus** algorithms to ensure replication across nodes is undertaken. One form of distributed ledger design is the **blockchain** system, which can be either public or private.

2021/7/6



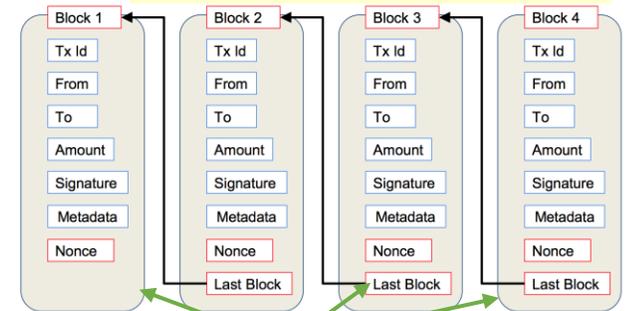
分布全球的比特幣網路

區塊鏈是比特幣的**共享帳本**：
所有支付交易記錄以區塊鏈形式
存放在其網路中的每個節點。

Blockchain =
Block + Chain

from to amount

from	to	amount
1b874A...	16BZZe8...	1.0
167sdu...	13kjhfg...	15.0
1lkj382S	1238fhdj...	6.0
1398fda...	1lkj382S...	500.0
1348dd...	1SD48sd...	34.0
1354sd...	13kjhfg...	1.0
148958...	1asdytr...	0.0001
1598fjk...	154gkeR...	3.0
13kjhfg...	16BZZe8...	2.0
167sdu...	1487djhk...	5.0
13kjhfg...	1238fhdj...	2445.0



特殊的(基於密碼學)鏈

區塊：由支付交易紀錄構成

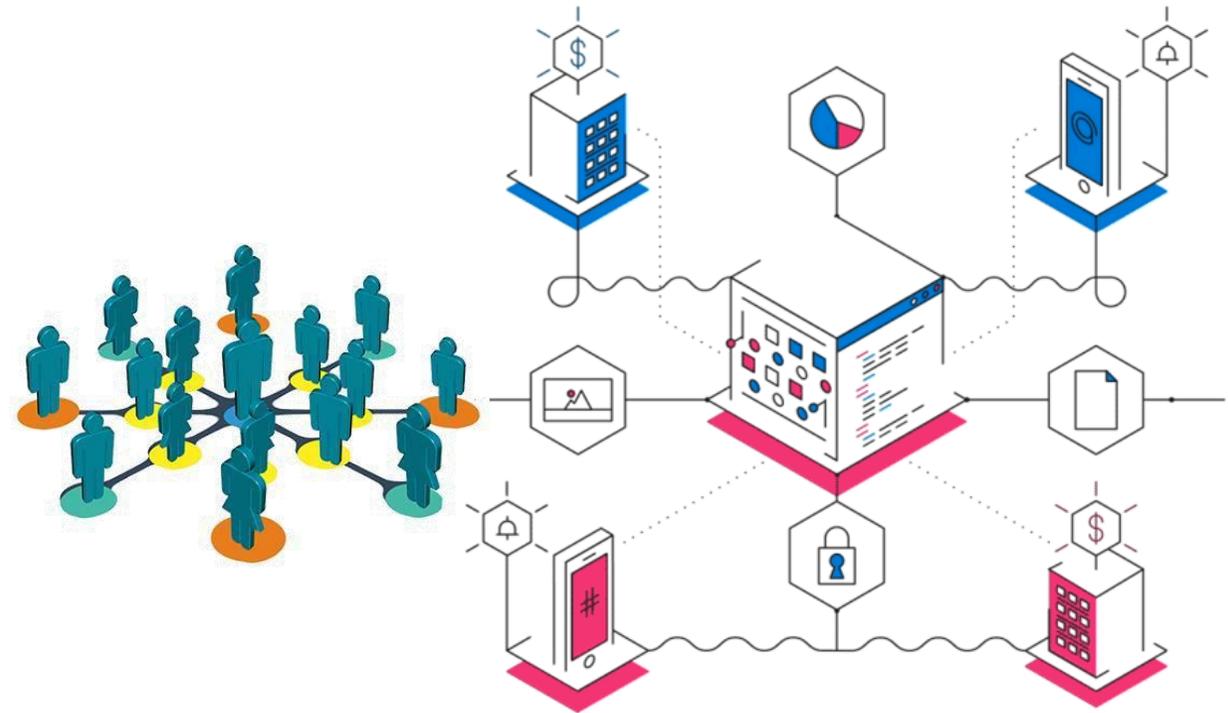


Immutability

Immutability can be defined as the ability of a blockchain ledger to remain **unchanged**, for a blockchain to remain unaltered and indelible. More succinctly, data in the blockchain cannot be altered.

Each block of information, such as facts or transaction details, proceed using a cryptographic principle or a hash value. That hash value consists of an alphanumeric string generated by each block separately. **Every block not only contains a hash or digital signature for itself but also for the previous one.** This ensures that blocks are retroactively coupled together and unrelenting. This functionality of blockchain technology ensures that no one can intrude in the system or alter the data saved to the block.

It is also important to know that blockchains are decentralized and distributed in nature, where a consensus is made among the various nodes that store the replica of data. This consensus ensures that the originality of data must be maintained.



Tokenization :

Token can be bitcoin

A token is, very simply, a piece of data that stands in for another, more valuable piece of information. Tokens have virtually no value on their own - they are only useful because they represent something bigger. A good analogy is a poker chip: instead of filling a table with wads of cash (which can be easily lost or stolen), players use chips as placeholders. The chips can't be used as money; they must be exchanged for it after the game.

Tokenization works by removing the valuable data from your environment and replacing it with these tokens. Most businesses hold at least some sensitive data within their systems, whether it be credit card data, medical information, Social Security numbers, or anything else that requires security and protection. Using tokenization, this data is taken out of your environment entirely, and then it is replaced with tokens that are unique to each piece of information.



Vote



Ownership Title



Record of
formal
schooling



Points

Blockchain property registry adoption levels



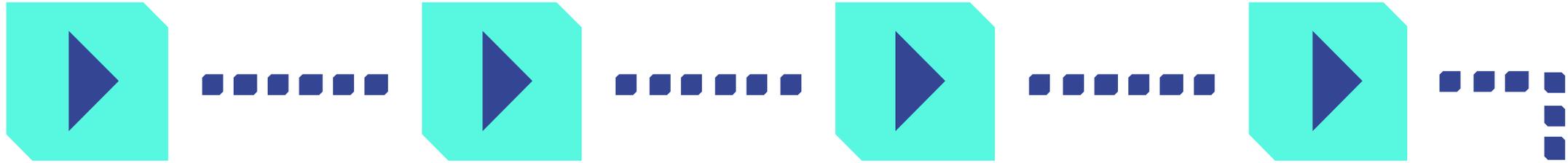
Level	Name	Description
0	No integration	No use of blockchain
1	Blockchain recording	Public blockchain used to record documents related to land registration
2	Smart work-flow	Blockchain used to record progress of a transaction
3	Smart escrow	Smart contracts used for escrowing payment
4	Blockchain registry	Central database replaced with a permissioned block-chain
5	Disaggregated rights	Various rights to a single parcel are disaggregated and managed via blockchain
6	Fractional rights	Rights for a given parcel are fragmented and managed via blockchain
7	P2P transactions	Rights are transacted without intermediaries on level 4 system
8	Interoperability	Different blockchain registries merge

Source: Graglia and Mellon, 2018, p.98



How blockchain can be used to substitute seals. As the case of E-contract in Taiwan

Contract initiators



Registration and log in

Upload contract

New signatories and field editing

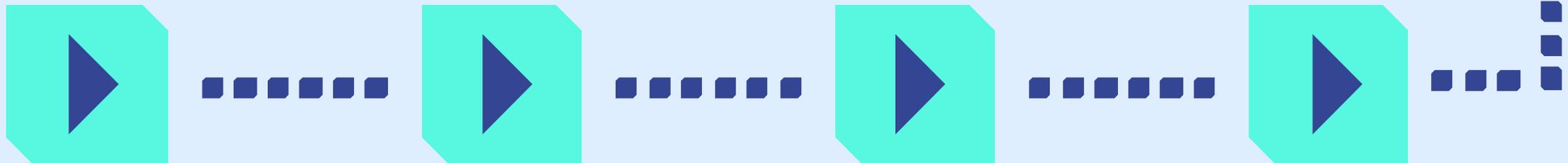
Issuing contract



Contract signers



Contract completed



Received the notice of contract signing invitation

Click on the contract-specific link

Enter the contract decryption password

Contract signing and sending

Contract initiators:

How to issue the invitation of contract signing?



STEP 01 / Registration and login



註冊

*登入帳號

請輸入Email

*行動電話

 0912 345 678

*設定密碼

請輸入8-16位英文加數字組合

請再次輸入密碼

*圖形驗證碼 

請輸入圖形驗證碼

我已閱讀並同意 [隱私權政策](#) 和 [會員條款](#) 的規範

註冊

1. Click to register
2. Enter login account (E-mail), phone number and password
3. Signing the agreement of the privacy policy and membership terms, and then click the register button.



☐ STEP 01 / Registration and login

驗證電子郵件

已寄送驗證碼至 ann.lu@entrance.asia，請輸入郵件內驗證碼，以完成註冊。

*驗證碼

送出

*尚未收到驗證碼？

重新發送驗證碼

Enter the e-mail verification number, the registration is completed.

STEP 01 / Registration and login

e-contract.entrance.asia

Contract 首頁 功能特色 區塊鏈即時數據 註冊 登入

登入

*帳號
請輸入電子郵件地址

*密碼
請輸入8-16位英文加數字組合

*圖形驗證碼 
請輸入圖形驗證碼

登入

[忘記密碼?](#)

1. Click "Login" at the top right
2. Enter the registered account (E-mail) and the password, then click the login button.

□ STEP 02 / Upload contract

e-contract.entrance.asia

Contract 合約管理 驗證合約 Yian

合約管理

上傳合約

待簽核 未完成 已完成 草稿 撤回

狀態 名稱 發送日期 立約人 待簽人數 操作

沒有符合的內容

總共 0 筆資料 上一頁 下一頁

Please click "Upload Contract" at the top right

□ STEP 02 / Upload contract

上傳合約

上傳

選擇本機PDF檔案(單次最多5筆)

選擇檔案

項次	名稱	檔案類型	操作
1	成屋買賣契約書範本.pdf	PDF	移除

1. Click the button of "Select File" and select the contracts you want to upload. You can select a file in your devices, and they must be in PDF format (up to 5 files can be selected at a time).
2. After your checking of the files, click "Upload" button. However, if you find that the files selection is wrong after uploading, you can click "Remove" button to select the contract file again. But the removed files are still counted for charges, please make sure again while you are going to click the button of upload.

STEP 03 / New signatories and editing the signing field

Contract 合約編輯 操作說明

新增簽署人 設定簽名框 清除簽名框 儲存草稿 發送合約

本契約不動產所在地

第十四條 契約及其相關 **New signatories / copy**

本契約自簽約日起生效，買賣雙方各執一份契約正本。←

本契約廣告及相關附件視為本契約之一部分。←

第十五條 未盡事宜之處置←

本契約如有未盡事宜，依相關法令、習慣及平等互惠與誠實信用原則公平解決之。←

定型化契約條款如有疑義時，應為有利於消費者之解釋。←

立契約人 (買方): 簽章←

國民身分證統一編號：A123456789←

地址：台北市 OO 區 OO 路 000 號 00 樓←

電話：09123456789←

立契約人 (賣方): 簽章←

國民身分證統一編號：B123456789←

地址：台北市 OO 區 OO 路 O 段 O 號 00 樓←

電話：0998765432←

STEP 03 / New signatories and editing the signing field

合約名稱：
不動產委託銷售契約書範本.pdf

簽署人 副本

簽約時, 啟用的人臉辨識 簽署人依順序簽署
(*拖拉數字可安排簽約順序)

電子郵件(必填) 行動電話號碼

1 @gmail.com

2 @entrance.asia

Em ail必填, 手機可免填

簽署人： 欲邀請簽署的人
副本： 不需簽署, 但合約完成後
會收到完成通知 (例如:秘書)

完成

@ 2021 Entrance Crop. All rights reserved 關於我們 / 會員條款 / 隱私權政策

1. Click the "Add Signer" button to start adding a signer and necessary duplicate receivers
2. Fill in email (required), mobile phone number
3. Click "Finish"

STEP 03 / New signatories and field editing

本契約不動產所在地之法院為

第十四條 契約及其相關附件效力

本契約自簽約日起生效，買賣雙方各執一份契約正本。↵

本契約廣告及相關附件視為本契約之一部分。↵

第十五條 未盡事宜之處置↵

本契約如有未盡事宜，依相關法令、習慣及平等互惠與誠實信用原則公平解決之。↵

定型化契約條款如有疑義時，應為有利於消費者之解釋。↵

立契約人 (買方): 簽章↵

國民身分證統一編號：A123456789↵

地址：台北市 00 區 00 路 000 號 00 樓↵

電話：09123456789↵

立契約人 (賣方): 簽章↵

國民身分證統一編號：B123456789↵

地址：台北市 00 區 00 路 0 段 0 號 00 樓↵

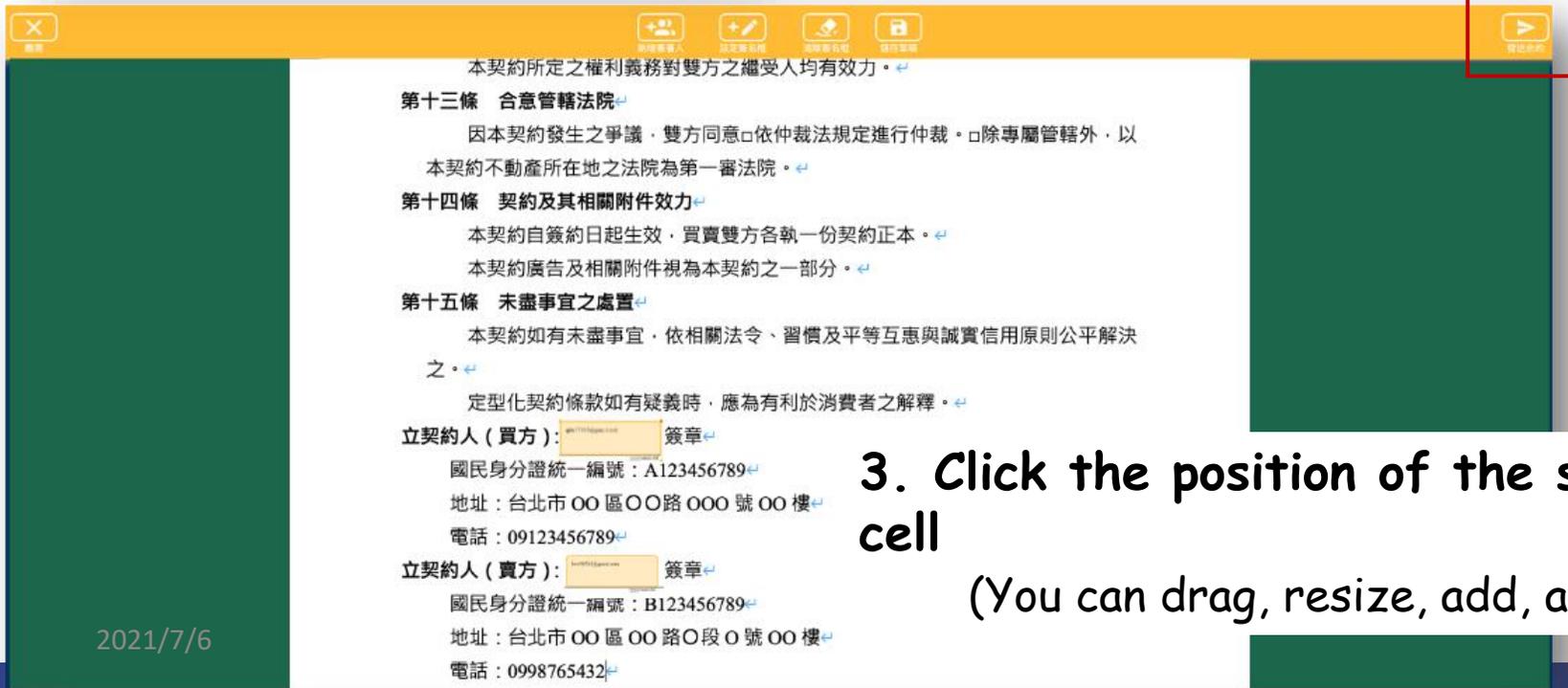
電話：0998765432↵

□ STEP 03 / New signatories and field editing

1. click  設定簽名框



2. Select the signer, add a signature cell
(⊗Each signer must set at least one signature cell)



3. Click the position of the signature cell
(You can drag, resize, add, and delete)

4. Click "Issuing Contract"



Contract signers:
How to complete the
contract signing?



□ STEP 01 / Received the notice of contract signing invitation , click the specific link

(測試) 【E-contract】邀請您透過本系統線上完成合約簽署 - 成屋買賣契約書範本.pdf

ES

E-contract Service <service@chainsecurity.asia>

週五 2021/6/11 上午 10:49

收件者: 呂翊安

ann.lu 邀請您一起透過「E-contract」系統簽署合約：

合約名稱：成屋買賣契約書範本.pdf

合約已加密保護，輸入下方解密密碼方可開啟。

● 合約解密密碼 (請先複製密碼再點擊下方連結)：

4xeGEnXR

● 您的專屬合約連結為如下：

<https://blockchainsign.page.link/TTqENtDb4oPdV3us7>

欲了解更多請至 [E-contract website](#).

回覆 | 轉寄



All signatories will receive the notices of contract signing invitation emails and they all sign through the dedicated link in the email.

Please copy the decryption password first and then click the link to sign the contract on the webpage. (Each signer's contract link and password are different)

❑ STEP 02 / Enter the contract decryption password

請輸入郵件中的合約解密密碼

.....|

送出

Click on the link and type the password informed through the email.

立契約人（買方）： 簽章

國民身分證統一編號：A123456789

地址：台北市 OO 區 OO 路 O 段 OO 號 O 樓

電話：09123456789

立契約人（賣方）：  簽章

國民身分證統一編號：B987654321

地址：新竹市 OO 區 OO 路 O 號 O 樓之 O

電話：0987654321

地政士：（由買賣雙方勾選下列方式之一）

買賣雙方各自指定地政士

 請簽名

STEP 03 / Contract signing and Sending

1. You can write or input your signature
2. After signing, click "Send"
3. You can view the contract, which has been signed.

Microsoft Word - BlockChain Sign Demo.docx

1 / 1 | 50%

第十三條 合意管轄法院
因本契約發生之爭議，雙方同意□依仲裁法規定進行仲裁，□除專屬管轄外，以本契約不動產所在地之法院為第一審法院。

第十四條 契約及其相關附件效力
本契約自簽訂日起生效，買賣雙方各執一份契約正本。
本契約廣告及相關附件視為本契約之一部分。

第十五條 未盡事宜之處置
本契約如有未盡事宜，依相關法令、習慣及平等互惠與誠實信用原則公平解決之。
定型化契約條款如有疑義時，應為有利於消費者之解釋。

立契約人(買方): 王小明 簽章
國民身分證統一編號: A123456789
地址: 台北市 OO 區 OO 路 OO 號 OO 樓
電話: 09123456789

立契約人(賣方): Jack 簽章
國民身分證統一編號: B123456789
地址: 台北市 OO 區 OO 路 OO 號 OO 樓
電話: 0998765432

士: (由買賣雙方勾選下列方式之一)
 買賣雙方各自指定地政士
買方地政士:
賣方地政士:
 買賣雙方協議之地政士: 陳元元

產經紀業:
 買方委託之不動產經紀業
 賣方委託之不動產經紀業
 買賣雙方委託之不動產經紀業
名稱(公司或商號):
地址:
電話:
統一編號:
負責人: (簽章)
國民身分證統一編號:

產經紀人
 買方委託之不動產經紀人:
 賣方委託之不動產經紀人:
 買賣雙方委託之不動產經紀人:
姓名: (簽章)
電話:
地址:
國民身分證統一編號:
證書字號:

民國 年 月 日

請簽名

項次	內 容	備註說明
1	<input type="checkbox"/> 有 <input type="checkbox"/> 無包括未登記之改建、增建、加建、違建部分: <input type="checkbox"/> 坐落 平方公尺 <input type="checkbox"/> 樓 平方公尺 <input type="checkbox"/> 項樓 平方公尺 <input type="checkbox"/> 其他 平方公尺	若為違建(未依法申請增、加建之建物)，賣方應確實加以說明，使買方得以充分認知此範圍之建物隨時有被拆除之虞或其他危險。
2	建物型態: 建物現況格局: <input type="checkbox"/> 有 <input type="checkbox"/> 無隔間; 若有, 房廳、衛。	一、建物型態 (一)一般建物:單獨所有權無共有部分(包括:獨棟、連棟、雙併等)。 (二)區分所有建物:公寓(五樓含以下無電梯)、透天厝、店面(店舖)、辦公商業大樓、住宅或複合型大樓(十一層含以上有電梯)、華廈(十層含以下有電梯)、套房(一房、一廳、一衛)等。 二、建物現況格局以交易當時實際之現況格局為準。現況格局例如:房間、廳、衛浴數,有無隔間。
3	汽車停車位種類及編號: 地上(下)第 層 <input type="checkbox"/> 平面式停車位 <input type="checkbox"/> 機械式停車位 <input type="checkbox"/> 其他。 編號: 第 號停車位 個, <input type="checkbox"/> 有 <input type="checkbox"/> 無獨立權狀。 <input type="checkbox"/> 有 <input type="checkbox"/> 無檢附分管協議書及圖說。 <input type="checkbox"/> 有 <input type="checkbox"/> 無約定專用部分; 若有, 詳見現附圖。	
4	<input type="checkbox"/> 有 <input type="checkbox"/> 無滲漏水之情形, 若有, 滲漏水處: 淨漏水處之處理: <input type="checkbox"/> 賣方修繕後交屋。 <input type="checkbox"/> 以現況交屋: <input type="checkbox"/> 減價 <input type="checkbox"/> 買方自行修繕。 <input type="checkbox"/> 其他。	
5	<input type="checkbox"/> 有 <input type="checkbox"/> 無曾經做過輻射屋檢測: 若有, 請檢附檢測證明文件。行政院原子能委員會網站已提供「現年劑量達1毫西弗以上輻射屋查詢系統」供民眾查詢輻射屋資訊, 如欲進行改善, 應向行政院原子能委員會洽詢技術協助。 <input type="checkbox"/> 賣方改善後交屋。 <input type="checkbox"/> 以現況交屋: <input type="checkbox"/> 減價 <input type="checkbox"/> 買方自行改善。 <input type="checkbox"/> 其他。	七十一年至七十三年領得使用執照之建築物, 應特別留意檢測。行政院原子能委員會網站已提供「現年劑量達1毫西弗以上輻射屋查詢系統」供民眾查詢輻射屋資訊, 如欲進行改善, 應向行政院原子能委員會洽詢技術協助。
6	<input type="checkbox"/> 有 <input type="checkbox"/> 無曾經做過混凝土中水溶性氯離子含量檢測(例如海砂屋檢測事項); 若有, 檢測結	一、八十三年七月二十一日以前, CNS3090 無訂定鋼筋混凝土中最大

Contract completed

(測試) 【E-contract】 合約已完成並存證區塊鏈 - 成屋買賣契約書範本.pdf

ES

E-contract Service <service@chainsecurity.asia>

週五 2021/6/11 上午 11:02

收件者:

您好：

所有簽署人皆已完成線上簽署，並成功存證於區塊鏈，特以本系統信件通知。

合約名稱：成屋買賣契約書範本.pdf

合約已加密保護，查閱請輸入密碼方可開啟。

● 合約解密密碼 (請先複製密碼再點擊下方連結)：

QyUfU8jB

(請妥善保管解密密碼，以避免外流產生洩密風險。)

● 您的專屬合約連結為如下：

<https://blockchainsign.page.link/HkhFmHtfBFaXWWbHA>

欲了解更多請至 [E-contract website](#)。



While the contract is completed the signing, each signatory will receive a completion notification letter. You can open the contract by clicking on the link and entering the decryption password.

回覆 | 轉寄

2021/7/6

30

Courses

 -Contract 合約管理 驗證合約 Ann.lu ▾

合約管理 上傳合約

待簽核 未完成 已完成 草稿 撤回

狀態	名稱	完成日期 ▾	立約人	待簽人數	操作
已完成	 成屋買賣契約書範本.pdf	2021/6/11 11:02:12	ann.lu	0	下載 檢視 歷程

總共 1 筆資料 前一頁 1 ▾ 下一頁

You can click "Course" in the list on the main screen to view the details of all procedures

合約歷程

列印

合約資訊

合約名稱： 成屋買賣契約書範本.pdf
立約者： ann.lu
上傳日期： 2021/06/11 10:45:01 UTC+8
完成日期：

Through the historical records, you can view all the details of the procedures of the contract, including date, user (device), operation and block height of the blockchain on the Ethereum .

操作紀錄

日期	使用者	操作	結果						
2021/06/11 10:45:01 UTC+8	ann.lu(Web)	上傳檔案	無						
2021/06/11 10:45:16 UTC+8	ann.lu(Web)	檢視	無						
2021/06/11 10:46:31 UTC+8	ann.lu(Web)	檢視	無						
2021/06/11 10:49:24 UTC+8	ann.lu(Web)	立約上鏈	<table border="1"><thead><tr><th>簽名</th><th>數位指紋</th><th>區塊鏈資訊</th></tr></thead><tbody><tr><td></td><td>9d31c08e97d7ffa3c3b74c80b9ec1c60bc43d2f4352e657a0bb9014db41b89cc</td><td>Postchain 塊高: 129632 以太坊錨定區塊: 即將錨定於以太坊</td></tr></tbody></table>	簽名	數位指紋	區塊鏈資訊		9d31c08e97d7ffa3c3b74c80b9ec1c60bc43d2f4352e657a0bb9014db41b89cc	Postchain 塊高: 129632 以太坊錨定區塊: 即將錨定於以太坊
簽名	數位指紋	區塊鏈資訊							
	9d31c08e97d7ffa3c3b74c80b9ec1c60bc43d2f4352e657a0bb9014db41b89cc	Postchain 塊高: 129632 以太坊錨定區塊: 即將錨定於以太坊							
2021/06/11 10:55:53 UTC+8	ann.lu(Web)	簽署上鏈	<table border="1"><thead><tr><th>簽名</th><th>數位指紋</th><th>區塊鏈資訊</th></tr></thead><tbody><tr><td></td><td>92a4b2bf43a57dd04f72218dfbfa73253245c5271144a78fc68f67232ce88b7e</td><td>Postchain 塊高: 129634 以太坊錨定區塊: 即將錨定於以太坊</td></tr></tbody></table>	簽名	數位指紋	區塊鏈資訊		92a4b2bf43a57dd04f72218dfbfa73253245c5271144a78fc68f67232ce88b7e	Postchain 塊高: 129634 以太坊錨定區塊: 即將錨定於以太坊
簽名	數位指紋	區塊鏈資訊							
	92a4b2bf43a57dd04f72218dfbfa73253245c5271144a78fc68f67232ce88b7e	Postchain 塊高: 129634 以太坊錨定區塊: 即將錨定於以太坊							

Verification of the contracts

Registered members can use [Contract verification] to confirm whether this contract exists on the blockchain.

Contract 合約管理 驗證合約 Qiuc77883邱秀姊

驗證紀錄

圖示	名稱	檔案類型	驗證時間	驗證結果	操作
----	----	------	------	------	----

驗證合約

選擇本機PDF檔案(單次最多5筆)

選擇檔案

項次	名稱	檔案類型	操作
1	成屋買賣契約.pdf	PDF	刪除

開始驗證

1. Click on the verification of contract in the list above
2. Select the file to be verified
3. Click "Start to Verify"

Verification of contracts

The verification is successful, this digital fingerprint exists in the blockchain

The screenshot displays the BLOCKCHAIN SIGN web application. The main page is titled "驗證合約" (Verify Contract). A modal window titled "驗證結果" (Verification Result) is open, showing the following information:

檔案名稱	驗證結果	區塊鏈資訊
BlockChain Sign Demo _ 雙人.pdf	數位指紋存在於 區塊鏈	Postchain 塊 高: 36594 以太坊鑰定 區塊: 即將鑰 定於以太坊

Below the table is a "確認" (Confirm) button. The background interface includes a navigation bar with "合約管理", "驗證合約", and "權限管理", and a user profile "Qiuc77883邱秀姝".

© 2020 Block Chain Security Corp. All rights reserved. 顯示語彙: Chinese(繁體中文) 關於我們 會員條款 隱私權政策

THANKS !

Do you have any questions?

Mail : cyuan@fcu.edu.tw

Phone : 04-24517250 #4705

