INTRODUCTION

What do people think of blockchain today?

One word has the potential to disrupt our economy, our politics, and ultimately our entire social systems, and that word is blockchain.

Ten years after its inception, blockchain and its underlying distributed ledger technology have become common research and policy topics.

With the success of Bitcoin and the explosion in potential applications, blockchain is expected to have a huge transformative impact on the public and private sectors. Moreover, the growing implementation of distributed ledgers and the emergence of the first operational executions present an opportunity to move beyond the speculation and hype. (Allesie, Sobolewski and Vaccari, **2019**)

It is common to compare blockchain technology to the Internet because both protocols facilitate data sharing and connectivity. However, contrary to the Internet, which guarantees seamless data transfer between computers, the blockchain enables the authenticity of digital information. It may even assign a monetary value to it. The Internet is an "information machine" that allows people to communicate with each other inexpensively and efficiently. Whereas the blockchain's data structure, cryptography, and timestamps ensure that data cannot be changed or revoked once linked, which is why it is considered a "truth machine."

What is Bitcoin and how does it relate to Blockchain?

Blockchain technology was originally introduced as the underlying distributed ledger for bitcoin transactions. Bitcoin represented the first collaborative, economically logical, self-sustainable, open-source, digital cryptographic currency. "[Blockchain] is to Bitcoin, what internet is to email. A big electronic system, on top of which you can build applications. Currency is just one." – Sally Davies, FT Technology Reporter. Therefore, in addition to being the basis of all cryptocurrencies, blockchain also has many applications outside of digital currencies, which makes it a revolutionary technology that has many possible advantages.

Why did BC initially become famous? (+ Implications)

A highly significant contributing factor to the 2008 financial crisis was investors and analysts placing a great deal of trust in central institutions. In the same year following the financial crisis, Satoshi Nakamoto, an anonymous programmer, proposed Bitcoin, a catalyst for the widespread use of distributed ledger technology provided by Blockchain. (Nakamoto, 2008) Blockchain technology allowed participants to build trust faster since it forewent third-party intermediaries and, as a result, revolutionized the financial services landscape. (Pilkington, 2016).

When did government start with Blockchain?

The advantages of blockchain are many, so its popularity within the public sector is rising rapidly. Governments are already harnessing blockchain technical capabilities by implementing sector-specific projects to address real-world problems. In addition, public sector systems built on blockchain technology could provide a range of public services. For example, blockchain technology is particularly suitable for public records that require a permanent, searchable, immutable data archive.

What are the implications of blockchain?

Blockchain technology as a mode of decentralization, could be the next major disruptive technology and world-wide computing paradigm (Following the mainframe, PC, internet and social

networking/mobile phones), with the potential for reconfiguring all human activity as pervasively as did the web.

CHAPTER 1: BLOCKCHAIN AND ITS RELEVANCE IN THE PUBLIC SECTOR

1.1 Blockchain Overview
Blockchain technology has changed the world by introducing a new digital cash on the Internet, an alternative currency dubbed Bitcoin, created and managed not by a central authority but by consensus among users. However, blockchain's true uniqueness lay in that it did not require the users to trust each other. Instead, an algorithmic self-policing system would reject any malicious attempt to defraud the system.

In a blockchain, an initial block often referred to as the Genesis block, records the first transactions. A blockchain is an infinite series of blocks. Each block contains records of transactions, arranged sequentially and cryptographically secured by an alphanumeric string of numbers called a hash based on the block's timestamp. When creating its hash, each block links immutably to the previous one using the previous block's hash.

Moreover, blockchain uses a computational process called consensus to validate the authenticity of a block of information before adding it to the chain. A majority of nodes in the blockchain network will have to agree that the new block's hash has been calculated correctly as part of this process. The consensus of the distributed ledger ensures that all copies are in the same state.

As a result of the encryption at the core of the blockchain's design, it is considered trustworthy and secure, because it is difficult to hack. In short, blockchain is a community-based technology that allows the safe exchange of data and information, a distributed database of sorts.

Figure 1 below provides a step-by-step walkthrough of how blockchain works.