

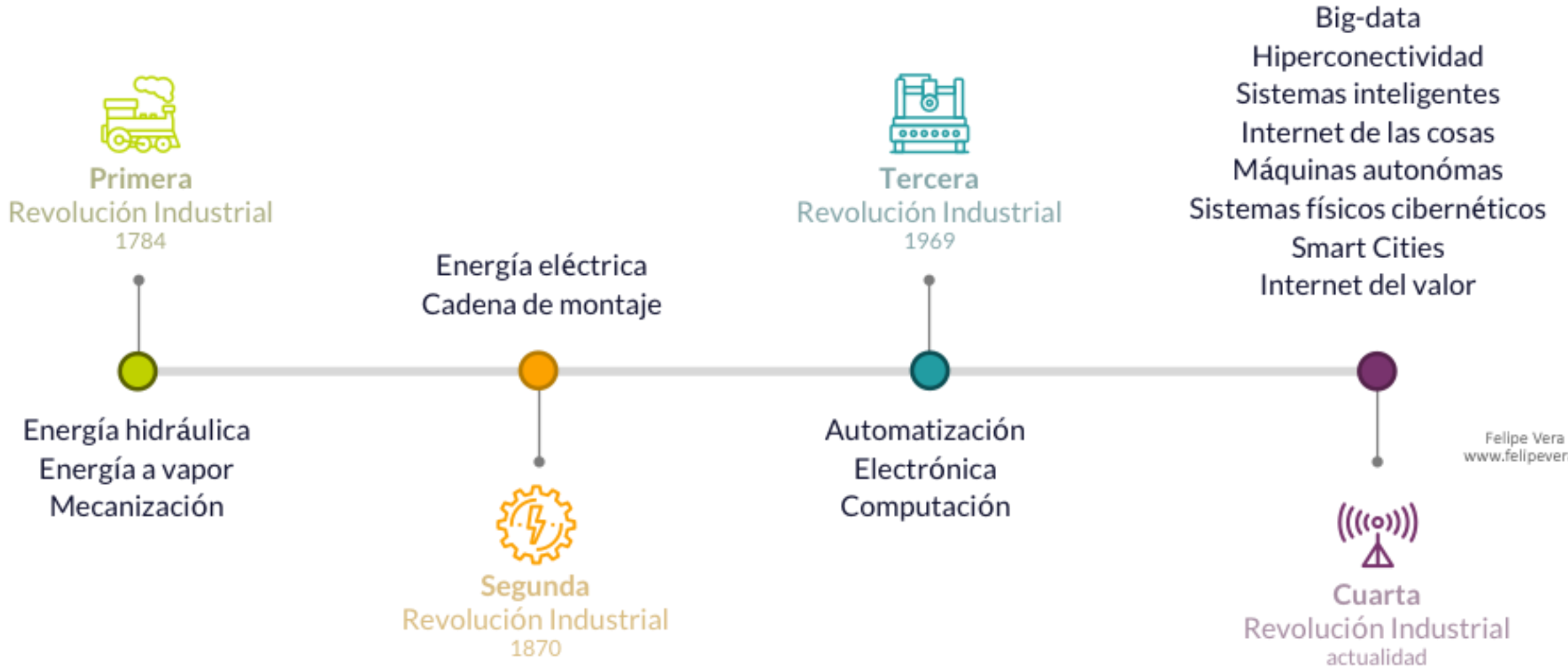


Introducción a  
**BLOCKCHAIN**

y su potencial uso en gestión de  
información bibliotecas y archivos

**Felipe Vera Lobos**  
Bibliotecario Documentalista  
Master in Business Engineering | U. de Chile  
2019

# REVOLUCIONES INDUSTRIALES



Felipe Vera Lobos  
www.felipevera.com





**Inteligencia Artificial**



**Big data**



Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)

**Gadgets en el cuerpo**



**Internet de las Cosas**



**Computación cuantica**



**Realidad virtual y Aumentada**



**Vehículos autónomos**



**Róbotica Y Drones**





Inteligencia Artificial



Big data



Gadgets en el cuerpo



Internet de las Cosas



# BLOCKCHAIN

## REGISTRO UNIVERSAL

4ta Revolución  
Industrial



Computación cuántica



Realidad virtual y Aumentada



Vehículos autónomos



Róbotica Y Drones

# INTERNET DE LA INFORMACIÓN



Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)

# INTERNET DEL VALOR



Fuente: Adaptación de "Tapscott, D., Tapscott, A. (2017). Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business and the World. DEUSTO".

# INTERMEDIARIOS



# INTERMEDIARIOS





# Bitcoin: A Peer-to-Peer Electronic Cash System

Satoshi Nakamoto  
satoshin@gmx.com  
www.bitcoin.org

**Abstract.** A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

## 1. Introduction

Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. While the system works well enough for most transactions, it still suffers from the inherent weaknesses of the trust based model. Completely non-reversible transactions are not really possible, since financial institutions cannot avoid mediating disputes. The cost of mediation increases transaction costs, limiting the minimum practical transaction size and cutting off the possibility for small casual transactions, and there is a broader cost in the loss of ability to make non-reversible payments for non-reversible services. With the possibility of reversal, the need for trust spreads. Merchants must be wary of their customers, hassling them for more information than they would otherwise need. A certain percentage of fraud is accepted as unavoidable. These costs and payment uncertainties can be avoided in person by using physical currency, but no mechanism exists to make payments over a communications channel without a trusted party.

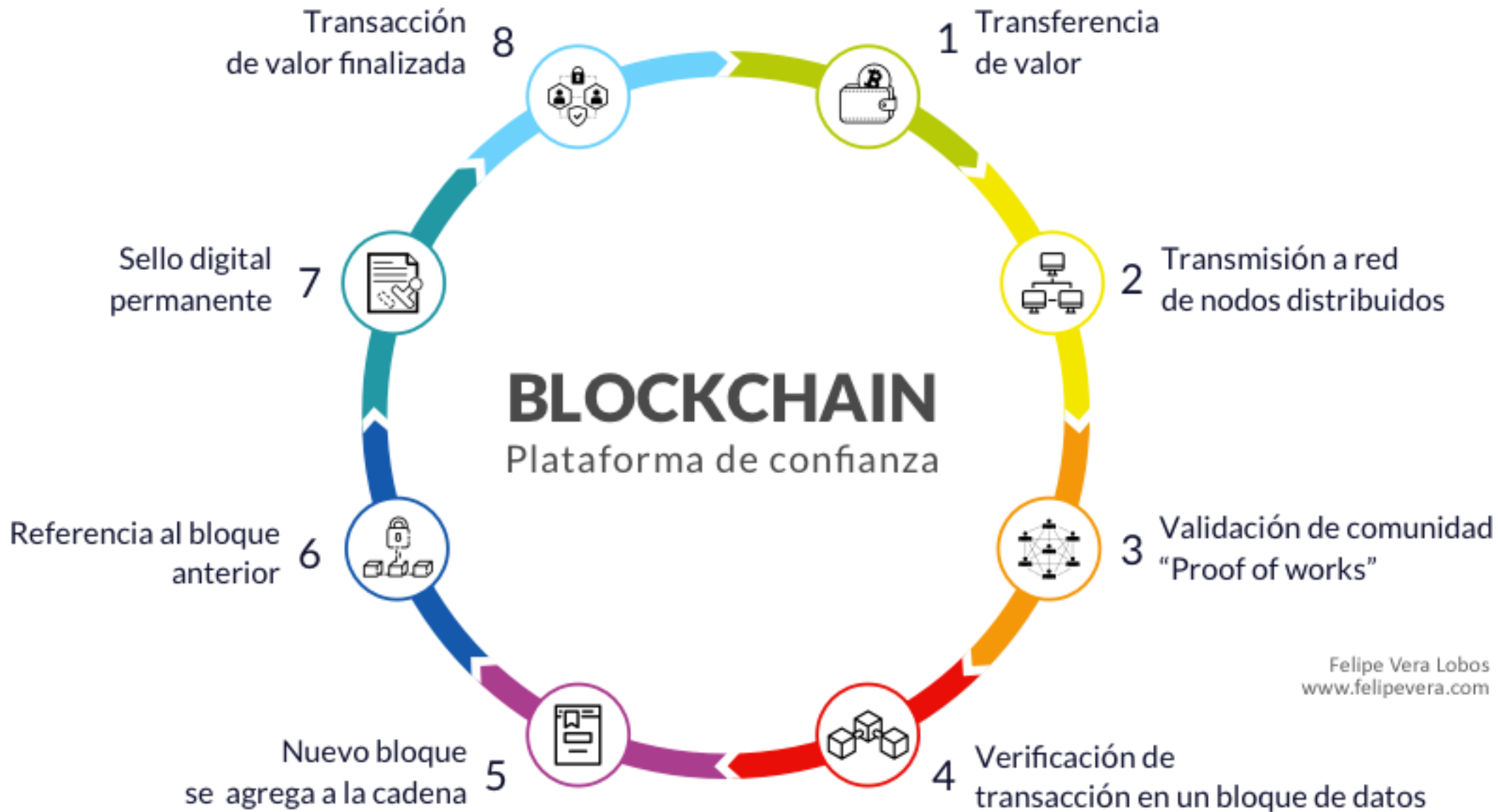
What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party. Transactions that are computationally impractical to reverse would protect sellers from fraud, and routine escrow mechanisms could easily be implemented to protect buyers. In this paper, we propose a solution to the double-spending problem using a peer-to-peer distributed timestamp server to generate computational proof of the chronological order of transactions. The system is secure as long as honest nodes collectively control more CPU power than any cooperating group of attacker nodes.



# CONFIANZA SIN INTERMEDIACIÓN



# ELEMENTOS FUNCIONALES DE BLOCKCHAIN



Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)



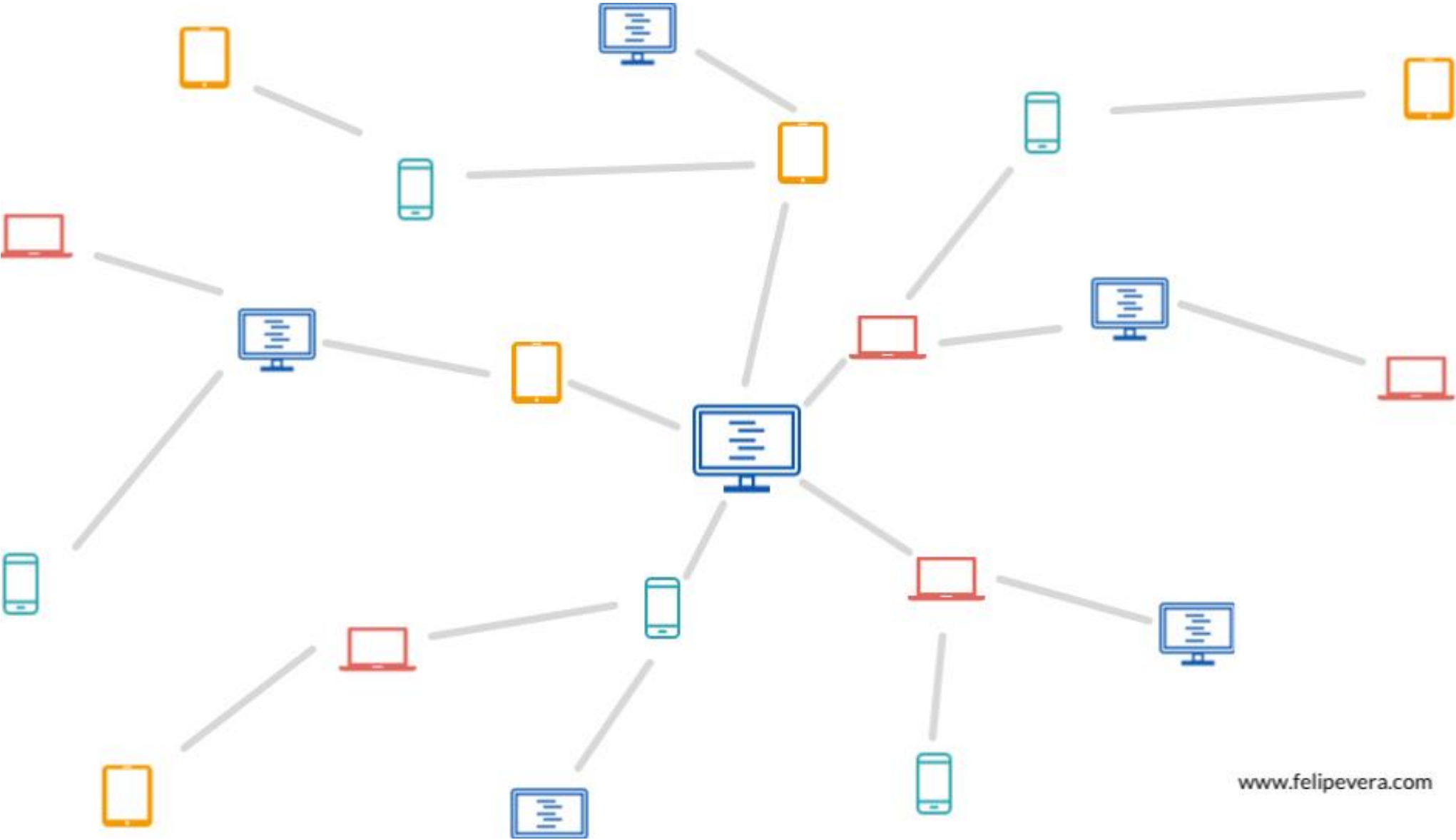
# ESQUEMA DE BENEFICIOS



# BLOQUES



# RED DE NODOS



[www.felipevera.com](http://www.felipevera.com)



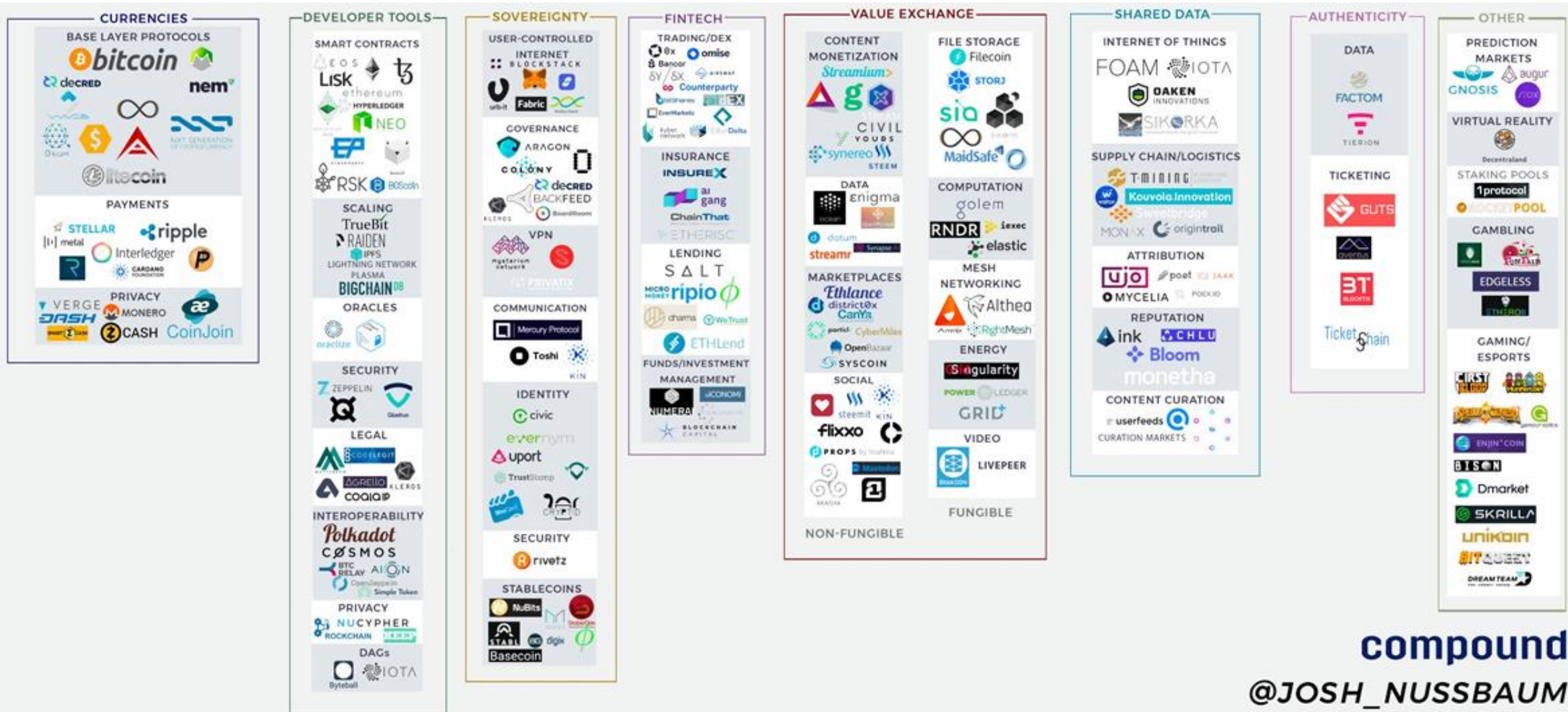
# PRUEBA DE TRABAJO (MECANISMOS DE CONSENSO)



# CREACIÓN DE UN BLOQUE



# ECOSISTEMA DE PROYECTOS BLOCKCHAIN, 2100+ "CRIPTO PROYECTOS"



compound  
@JOSH\_NUSSBAUM



# CONTRATOS INTELIGENTES

Devcon 4 takes place between Oct 30th and Nov 2nd, 2018.



ethereum

BLOCKCHAIN APP PLATFORM

# LA ECONOMÍA DE LAS MÁQUINAS

NEWS

WALLET

QUBIC

DOCS

ECOSYSTEM



GET STARTED 

THE FOUNDATION 

VERTICALS 

RESEARCH 

CONTACT US 

**Redefining trust,  
value, and  
ownership**



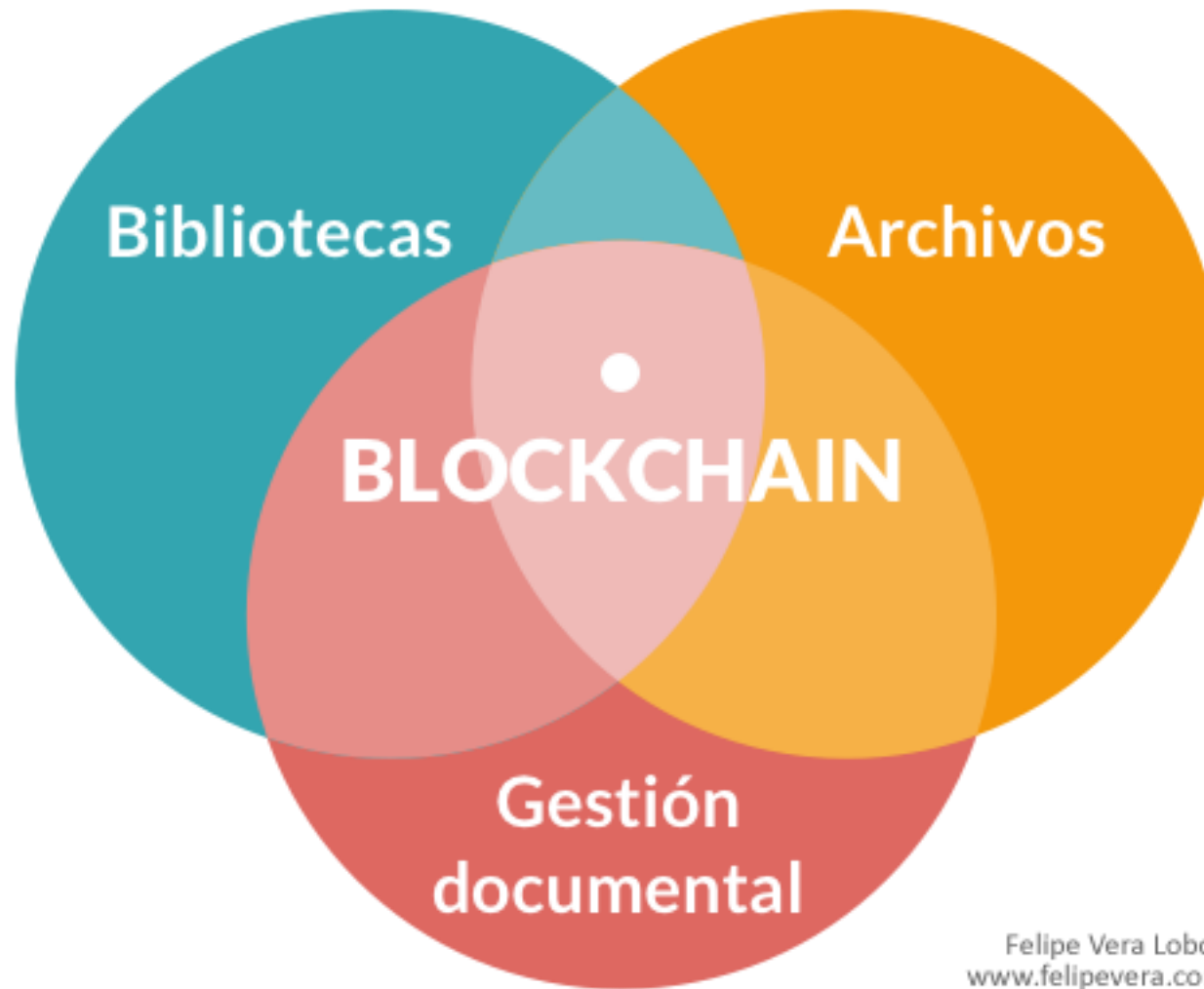
# UN NUEVO PARADIGMA PARA LAS UNIDADES DE INFORMACIÓN



Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)

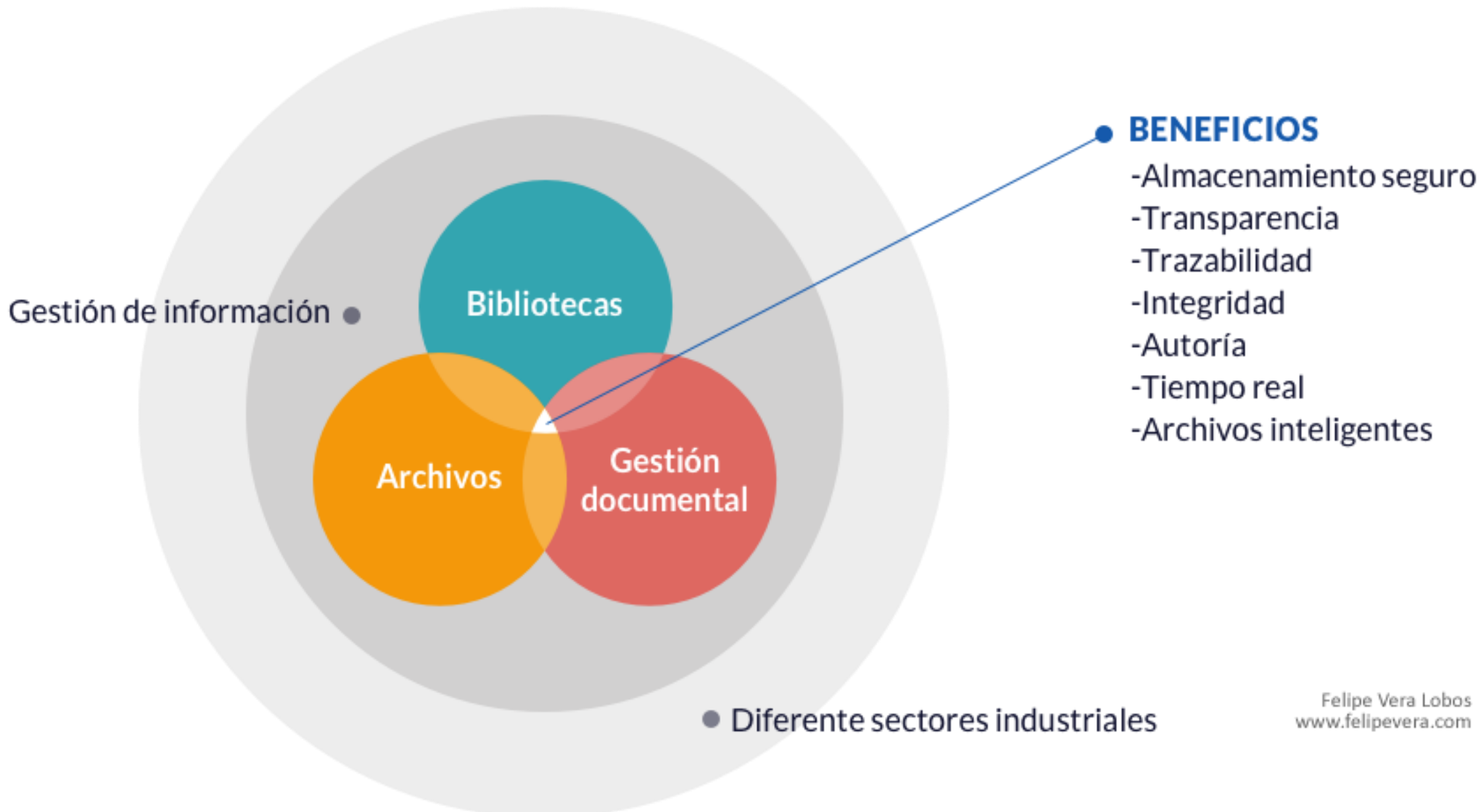


# GENERALIZACIÓN EN GESTIÓN DE INFORMACIÓN



Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)

# GENERALIZANDO CASOS EN GESTIÓN DE INFORMACIÓN



Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)

# CASOS DE USO



- Credenciales únicas
- Préstamos autónomos
- Redes de bibliotecas descentralizadas
- Nuevos modelos de acceso abierto
- Bibliotecas autónomas descentralizadas (DAL - DAO)
- Nuevos mecanismos de propiedad intelectual
- Servicios sin intermediación (Ej. handle y ORCID)

Felipe Vera Lobos  
www.felipevera.com



# CASOS DE USO



## Archivos

- Autenticidad de registros y documentos
- Registros médicos electrónicos
- Registros de trámites gubernamentales
- Documentos inteligentes
- Preservación del patrimonio documental
- Trazabilidad y certificación de documentos

Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)

# CASOS DE USO

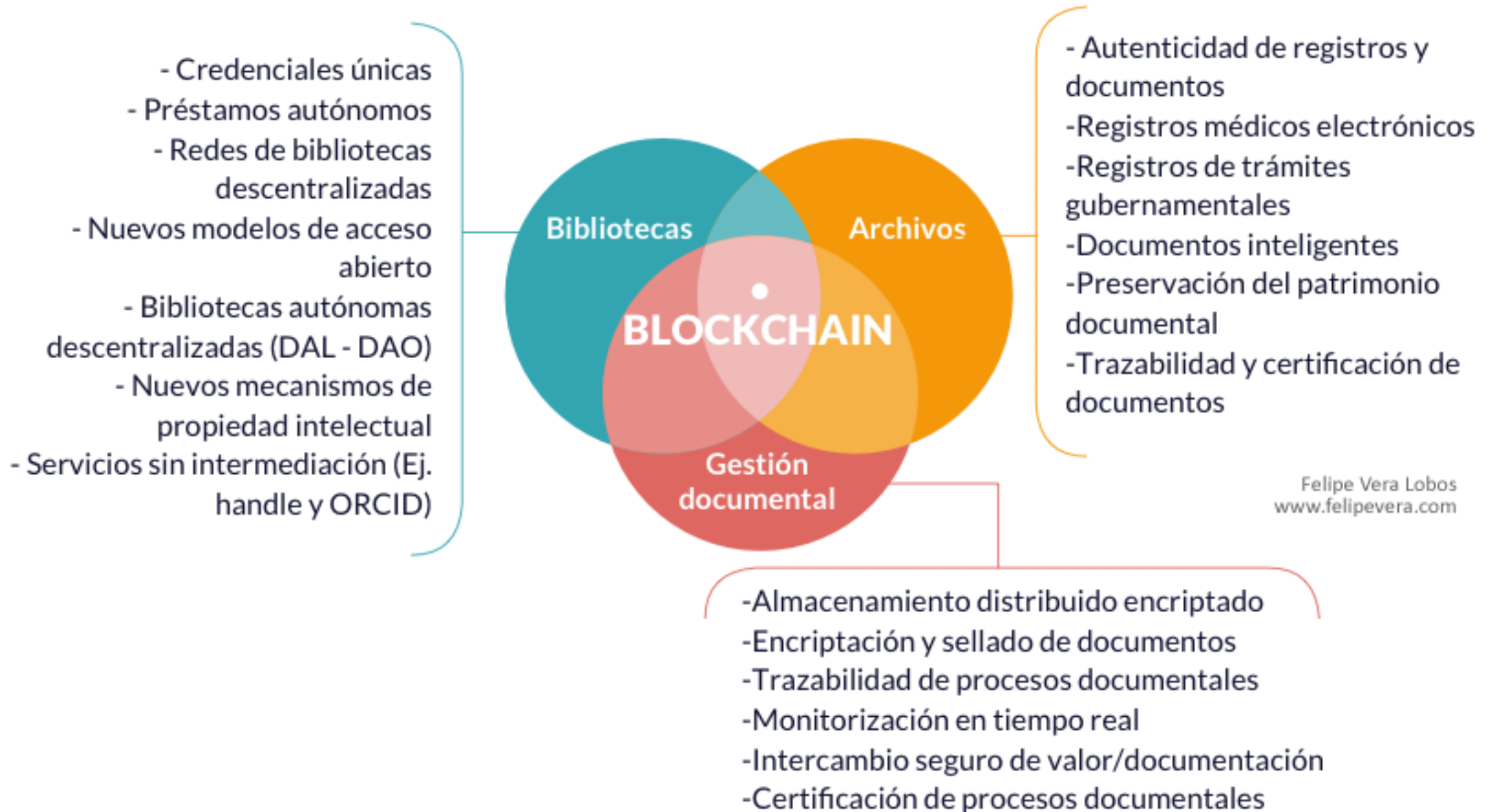


## Gestión documental

- Almacenamiento distribuidos encriptado
- Encriptación y sellado de documentos
- Trazabilidad de procesos documentales
- Monitorización en tiempo real
- Intercambio seguro de valor/documentación
- Certificación de procesos documentales

Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)

# GENERALIZANDO CASOS EN GESTIÓN DE INFORMACIÓN



Felipe Vera Lobos  
[www.felipevera.com](http://www.felipevera.com)



# CAPACIDAD TRANSVERSAL: Almacenamiento Descentralizado



<https://sia.tech>



<https://filecoin.io>



<https://storj.io>



<https://dadi.cloud/en>



<https://swarm.fund>



<https://maidsafe.net>

## PROYECTOS DE ALMACENAMIENTO

- Almacenamiento en la nube pero distribuido
- Desagregación de puntos de control y fallos
- Persistencia de la información
- Mayor eficiencia económica
- Rentabilización y control de espacio sobrante

## San Jose State University



### Introduction: Blockchain Project

The goal of this IMLS-funded project is to gain a better understanding of blockchain technology and imagine its potential for small and large, urban and rural libraries and their communities.

[READ MORE »](#)

### Ways to Use Blockchain in Libraries

There are several ways in which information professionals may be able to adopt and benefit from this technology. The following scenarios are just a few examples to get the conversation started.

[READ MORE »](#)

### Blockchain National Forum

Take the conversation on the road and network with industry professionals at any number of tech- and blockchain-themed conferences happening throughout the U.S. and worldwide.

[READ MORE »](#)

# CASO DE USO: Redes de Bibliotecas y prestamos inter-bibliotecarios

## Blockchain National Forum

livestream

EVENT | AUGUST 6, 2018 - 9:00AM

As part of the [Blockchain Technology grant project](#), the iSchool presents the Blockchain National Forum with technical experts who will present their views on the ways that the information profession can implement blockchain applications. Each speaker has developed an executive summary that will be posted on the [blockchain website](#) and used to develop the final recommendations. The speakers represent different types of libraries and archives throughout North America and professional organizations, such as the American Planning Association, Digital Public Library of America, NISO, OCLC, ALA, LITA, and ConsenSys.

The public is invited to participate in the Blockchain National Forum via livestream from 9 a.m. to 5 p.m. Pacific Time.

Session Link: <https://livestream.com/accounts/20480259/events/8179548>

## POTENCIAL EN BIBLIOTECAS UNIVERSITARIAS

(Blockchain National Forum, **San Jose State University**)

1. Metadatos distribuidos
2. Sistema de gestión de derechos
3. Decisiones basadas en datos
4. Almacenamiento distribuidos
5. Gestión bibliotecaria descentralizada y autónoma (basada en contratos inteligentes)
6. Economía P2P más allá de solo el prestamos de libros

# CASO DE USO: Mejora de la investigación, medición y comunicación académica

## ALGUNAS CONCLUSIONES DEL REPORTE

<https://www.digital-science.com/resources/digital-research-reports/blockchain-for-research/>



- Facilitar la carga automática, sellado y, en caso necesario, cifrado de datos de investigación;
- Agilizar el flujo de trabajo de investigación y reducir los errores;
- Proporcionar una función de notarización permitiendo a los investigadores publicar un texto o archivo con ideas, resultados o simplemente datos;
- Registrar diseños de estudio utilizando la cadena de bloques;
- Utilizar contratos inteligentes para que en los protocolos de investigación que se establezcan en la “cadena de bloques” se automaticen incluso antes de que se recojan los datos, la metodología y el análisis.
- Mejorar el proceso de revisión por pares podría a través de la “cadena de bloqueo” de manera que los datos subyacentes a los resultados publicados podrían estar disponibles con antelación.



# CASO DE USO: Archivo Nacional del Reino Unido

UK Research and Innovation

Home About this system Release history Contact us

## ARCHANGEL - Trusted Archives of Digital Public Records

Lead Research Organisation: [University of Surrey](#)  
Department Name: Vision Speech and Signal Proc CVSSP

[Go back](#)

Overview Organisations People Outcomes

### Abstract

The aim of ARCHANGEL is to ensure the long-term sustainability of digital archives through the design, development and trialling of transformational new distributed ledger technology (DLT) to promote accessibility and ensure integrity of content, whilst maximising its impact through novel business models for commodification and open access.

Archives and Memory Institutions (AMIs) are the lens through which future generations will perceive today; they form the authoritative economic, social and cultural memory of a nation. For example, The National Archives (>15 petabytes) is one of the world's largest and oldest AMIs responsible for preserving the digital record of the UK Government e.g. key decisions made by Ministers and advice received. Some of this information is made open, some kept closed for decades. AMIs are founded upon the principle of public trust, of being neutral and completely trustworthy; the immutability and integrity of AMIs are essential to maintaining their objectivity. Yet world history is littered with examples where this objectivity has been compromised e.g. through expunging of physical records during times of political unrest. Today's digital age presents new socio-technical challenges to AMIs around safeguarding of data. Digital public records are intangible and so easy to remove or modify without that modification necessarily being detectable. Indeed in some cases records have to be modified to ensure their continued accessibility as formats change and the curation of data is also accompanied by the need to maintain associated code to render that data for presentation, often across decades. How should decisions over migration or prioritisation of maintenance be taken, or audited? What are the implications of migrations resulting in minor losses of fidelity one hundred years from now? How can the public be sure that digital content when released is fundamentally unaltered from the original? Existing archival practice is ill-equipped to respond to such issues, and is in urgent need of disruption to keep pace with our transformation into an increasingly digital society, so ensuring the integrity and impartiality of knowledge for future generations.

ARCHANGEL is a 18 month socio-technical feasibility study co-creating and evaluating a novel prototype DLT service with end-users to determine how archival practices, sustainable models and public attitudes could evolve in the presence of a trusted decentralised technology to prove content integrity and ensure open access to digital public archives. From a technological standpoint, ARCHANGEL will leverage cutting-edge machine learning to collect robust digital signatures derived from digitised physical, and born-digital content, within a permissioned DLT. Both signatures and programmatic code to render content and verify its provenance and integrity will be encoded within the DLT. Novel business models for sustaining the DLT e.g. via contributed effort (proof of work) will be explored at the points of creation and consumption using a cross-AMI model in which a single DLT is contributed to by multiple AMIs, across disciplines and nations, mitigating risk of archive distortion by its operating AMI. Impact is not limited to traditional AMIs, but any digital public archive: University research data repositories (linked to DOI); better management of corporate memory in multi-nationals (e.g. financial/regulatory compliance, managing records of prior art in tech companies).

To undertake this adventurous and ambitious project we have formed a strategic multi-disciplinary partnership uniting a world-leading group in multi-modal signal processing (CVSSP), the Centre for the Digital Economy (CODE) within Surrey Business School, and a consortium of AMI stakeholders including The National Archives and Tim Berners-Lee's Open Data Institute (ODI). The infrastructure will be developed with DLT platform provider Guardtime, and impact accelerated via Methods Digital.

**Funded Value:** £487,427  
**Funded Period:** jun 17 - jun 19  
**Funder:** EPSRC

**Project Status:** Active

**Project Category:** Research Grant

**Project Reference:** EP/P03151X/1

**Principal Investigator:** [John Philip Collomosse](#)

**Research Subject:** Economics (20%)  
Info. & commun. Technol. (80%)

**Research Topic:** [Behavioural & experimental eco \(20%\)](#)  
[Human-Computer Interactions \(10%\)](#)  
[Information & Knowledge Mgmt \(70%\)](#)

## PROYECTOS ARCHANGEL

**Foco:** Preservar la autenticidad de sus registros.

### Fundamento del proyecto:

*"Estamos explorando cómo podemos saber que un registro digital se ha modificado, si el cambio fue legítimo, y si en última instancia, todavía se puede confiar en él como el registro auténtico".*

### Enlace proyecto:

<https://gtr.ukri.org/projects?ref=EP%2FP03151X%2F1>



Introducción a  
**BLOCKCHAIN**

y su potencial uso en gestión de  
información bibliotecas y archivos

**Felipe Vera Lobos**  
Bibliotecario Documentalista  
Master in Business Engineering | U. de Chile  
2019