Evidence Report

APPG BLOCKCHAIN

UK Parliament

EDUCATION & SPORT

Blockchain applications - regulation, policy & strategy

appg

ALL-PARTY Parliamentary Group on Blockchain

2019 OCTOBER

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Table of Contents

1. APPG on Blockchain Evidence Meeting – Education and Sport

1.1. Purpose

The mission of the All-Party Parliamentary Group on Blockchain (APPG Blockchain) is to ensure that industry and society benefit from the full potential of blockchain and other distributed ledger technologies (DLT) making the UK a leader in Blockchain/DLT's innovation and implementation.

The tenth evidence meeting was divided into two sections. The first part of the meeting explored the use of the Blockchain technology in the Education & Sports sectors while the second part focused on the potential uses of Blockchain technology for the Charity sector.

The report provides a summary of the takeaways and evidence presented in the meeting on Education and Sport.

The Video recording of the session is available on our websites APPG Blockchain *www.appg-blockchain.org/* and Big Innovation Centre *www.biginnovationcentre.com/*

1.2. Details of the Meeting

- Date, 25th June 2019
- Time, 5:30 – 7:00 pm BST
- Location, Portcullis House, House of Commons
- Number of Attendees, 47

From left: Chair Damian Moore, Rapporteur Fernando Santiago-Cajaraville, Smart Economy Lead Sayali Borole

1.3. Panellists: Evidence Givers, Chair & the Secretariat

The APPG Blockchain Chair Damien Moore Member of Parliament and Vice-chair Lord Truscott chaired the evidence meeting.

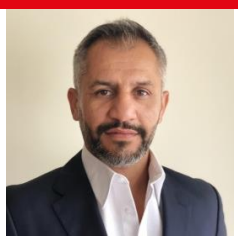
Big Innovation Centre acted as the Secretariat for the APPG on Blockchain, led by CEO, Professor Birgitte Andersen and Fernando Santiago-Cajaraville as the Project Manager and Rapporteur.

Building a robust Blockchain ecosystem is part of the APPG on Blockchain mission. In line of building the ecosystem, this APPG meeting on Education & Sports had representatives from different start-ups to bring into parliament the latest developments in the application of Blockchain technology within Education and Sport sectors.

Evidence Givers

Lisa Short,
Director,
Mind Shifting,
Z School

Dr Maria Vigliotti,
Director,
Gradbase



Oner Avara
CEO
My Next Match

Chair

Damien Moore
MP
House of Commons,
UK Parliament

Vice Chair

Lord Truscott
House of Lords,
UK Parliament

Secretariat

Professor
Birgitte Andersen
CEO
Big Innovation Centre

Fernando
Santiago-Cajaraville
Project Manager &
Rapporteur
Big Innovation Centre

2. Background

The tenth APPG on Blockchain evidence meeting was in two parts - Education & Sport. The meeting aimed to explore the current uses of Blockchain in each respective sector, along with the most successful use-case within them.

The APPG on Blockchain presented the following guiding questions to the Evidence givers:

Education and Research

- How can blockchain develop global networks for learning?
- Does Blockchain offer a model for the secure collection and sharing of all competency and education records?
- Can the Blockchain technology serve to aid/transform the peer academic review process?

Sport

- How can blockchain develop help the sports industry?
- Does Blockchain offer a model for the secure collection and sharing of trusted records of athletes and sports persons.

From left to right: Lisa Short, Dr Maria Vigliotti, Oner Avara

3. Meeting Takeaways - Education Sector

1. Blockchain has the potential to improve efficiency within the education system

The use of Blockchain can bring massive savings by issuing and verifying credentials from the universities and employers' perspectives. For example, considering risk management, deploying certificates on Blockchain networks could mitigate the risk of fake degrees.

Blockchain offers an excellent opportunity to the reduction of cost to prove compliance. *(M. Vigliotti)*

Distributed ledger technology can help libraries expand their services by building an enhanced metadata archive. It can improve the access of community libraries and access to resources with an affordable cost.

Smart contracts could be implemented for learning and assessment strategies, reducing costs and increasing efficiencies.

Blockchain can bring down a lot of costs, bringing a lot of benefits not only to the university but also to the student. *(L. Short, Mind Shifting)*

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2. Blockchain has the potential to be the definitive tool to fight against fake degrees

Deploying Blockchain will enable anyone, anywhere to verify academic and professional qualifications instantly and effortlessly via blockchain. It also enables experienced professionals to keep all their valid career qualifications in one place.

Having the opportunity to put a qualification on the blockchain provides assurance to students that the qualification is meaningful *(M. Vigliotti)*

Blockchain enables to report trustworthy and verified records *(M. Vigliotti)*

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3. The government should support educational institutions to innovate

Although Universities and educational institutions are interested in opening up, they tend to be very cautious due to heavily regulated sector within which they operate. Fears related to GDPR and privacy compliance are a deterrent to exploring Blockchain solutions.

To help in this matter, the government should facilitate the creation of sandbox approach that can provide a safe environment for universities to innovate and try new technologies.

"We have the technology; we just have not got the driven capacity to implement change, and that's government's role in leading that."
(L. Short, Mind Shifting)

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4. Blockchain, a useful tool to recruit the best talent

With the shortage of skills in some areas, the UK could benefit from a trustworthy global registry of certification, where Universities, recruiters and others relevant actors can work together to recruit the best talent available across globe.

Employers can query the blockchain for people with a particular skill set or a combination of skills to fit into a workplace. *(L. Short, Mind Shifting)*

Putting qualifications on Blockchain is not only for the benefit of the university, but it is also for the benefit of the economy. (*M. Vigliotti)*

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5. Awareness of Blockchain for sports must grow

Currently, there is no historical medical footprint of data available for the athletes. The lack of data jeopardises the national governing bodies accountability, athlete's well-being, andthe sport itself.

"In a fast-evolving world, sport is increasingly subjected to technological socio-economic and geopolitical political developments"
(O. Avara, My Next Match)

Blockchain record keeping could impact approximately sixty per cent of the current processes, from recreational participation to elite level Blockchain can improve efficiency without disrupting the current plans or strategies.

Federation bodies should work in favour of environmental, ethical, and efficient methods by exploring the implementation of Blockchain, existing lack of awareness could affect the implementation of blockchain in the international sporting hierarchy.

4. Education Evidence Giver's Transcripts

4.1. Lisa Short, Director Mind Shifting, Z School

Lisa Short, Director at Mind Shifting, Z School

The fourth Industrial Revolution is evolving at an exponential an unprecedented pace of speed and change. It is disrupting almost every industry globally, including governments, with a break depth change, the transformation of entire systems. Many people would argue that the blockchain distributive ledger technology is at an evolving stage; however, the technology is advancing much faster than we can cope with.

Governments, educators, businesses, workforce and society need to understand the changing environment, we need to be resilient to its changes, and we also need to be relentless in continually learning to innovate

The current educational framework is dated in the eighteen hundred when the time and relevance to study, learn, and develop capabilities were very mechanistic, so it is a very different environment.

In terms of education, systemic change is urgently required. The UN and the World Economic Forum signed an agreement where they named six critical areas, where education skills, digital cooperation and gender equity were included among them. At the moment systemic educational reshaping does not feature as a priority on the national agenda

In terms of the blockchain, we do regularly hear headlines on how blockchain can transform our daily lives. In emerging areas of the world such as Africa harnessing the potential will be indispensable for social and economic inclusion.

There are two vast areas where blockchain can have the most considerable impact,

- The operational or the business side of education
- Reshaping the system to be a new paradigm

Operational and business side of education. In terms of education, lowering costs, introducing new revenue streams, and improving operational efficiency is the core potential from blockchain technology regardless of what industry we are talking about.

Using Blockchain can bring massive savings in issuing and verifying credentials, assets, research, IP, or authentication. However, there are key challenges and questions; for example, credential issuers need to cooperate in large numbers. The number of institutions that have to cooperate, education bodies and public policies would need to be modified massively to reconfiguring the educational system and the importance of common language across is significant as well. The question is who is going to act now and do something about it.

We have the technology; we just have not got the driven capacity to implement change, and that's government's role, leading that. We can also have institutions advocating and using technology.

We already have the technology; we do not have to reinvent it; we just have to use it.

Blockchain provides us with the capacity to,

- Make and accept payments; pay anything on the supply chain or provide financial aid when a student needs it
- Have a sovereign identity. Sovereign identity has the potential to be a key area in terms of blockchain, where every single individual in the world have a sovereign identity link to the data that have their lifetime education certifications captive in a wallet
- Have infrastructure security
- Have decentralised management of records and data
- Have the capacity to interoperate with other systems and move to a virtual storage
- Have energy and smart institutional management. There are peer-to-peer blockchain solutions for power

Distributed ledger technology can help libraries expand their services by building an enhanced metadata archive, where we can start to have community libraries to access to excellent resources

Smart contracts in learning and assessment strategies, can significantly reduce costs and increase efficiencies, internally and externally, between learners and educational institutions or between employees and the staff of educational institutions or anybody to the organisation.

The trustworthy blockchain records should not be confused with the quality or the value of their content

Because the value of the content is only as good as the inputs that they receive, if we are talking about a smart contract, it is only as good as the content that all of us put into it. The piece of technology will do what we wanted to do; however, we have to be able to put good content into it.

Operational changes will not lead to a revolution in education.

These changes will just fix an existing system that is not fit for purpose, does not deliver on future learning and in the future of work. Operational changes just make the system more efficient and more cost-effective. Whilst we're making the existing system cost-effective and more efficient it gives us time, opportunity, and resources to develop a concurrent system that will start to meet some of the learning outcomes and the requirements that we need to move forward.

Real potentials and real solutions do exist. The government can participate in them in three sorts of areas,

Verified credentials on Blockchain. Employers or other educators can query the blockchain, for example, for people with a particular skill set and combination of skills to fit into a workplace. They can complete that project in that work, and they can apply a value to what they have got the skill that they have applied and also the value of their learning. Hence, there is a return on investment for the institution that provides education. Still, there is nothing like value required for the individual who has obtained those skills and more importantly, their skills that will be applied in the workforce. Human resource personnel will be able to calculate the return on their training and development investment, instead of it being a cost, it becomes an investment. It flips the model from being and a cost to the government to being an investment

Develop rigorous valid and reliable assessments. The work is longstanding; however, the issue of scalability is untouched. We should scale assessment to scale education.

Education itself is not scalable because if we cannot measure learning, we cannot measure and use assessment.

Establishing partnerships and synergistic technology ecosystems with other technologies such as AR, VR and AI can deliver both, immersive learning and assessment capture, that in live time verifies all aspects of multi-dimensional competence, and record these on a blockchain learning ledger. The capacity to broaden the learning and include values-based skills for engaging in collaborative partnerships is absolutely moon-shot. Challenges of moderation, validation, and inadequate numbers of expert educators can be mitigated and delivered to millions of learners globally, particularly those who are marginalised.

The curation of learning content. It is relevant to the coalescence of the transversal skills that we need to move forward in the 21st century. They are very different from the set of skills that we had when we were at school. Resilience, creativity, ability to manage change, entrepreneurship and social entrepreneurship are critical. Under the current system, those are not tangible skills, it is challenging to measure them. Using a blockchain and using immersion learning, we can capture those skill sets and behaviours. We can record them in live time on a blockchain ledger, at the same time they are recorded on a learning engine for an organisation or institution can go into a wallet, where the individual has a sovereign identity on and ownership.

Immerse learning experiences can now capture things like the environment, GPS locations or tone of voice; they can be capture and log on a blockchain. A skill can be demonstrated in real-time in a real work experience.

Challenges

One of the challenges of reshaping an education system, that is not fit the purpose, is ensuring that the educators, the trainers, the assistants, and the teachers are relevant and engaging in the same learning environment. All of those have to participate in professional development, and learning is done in many cases, socially and collaboratively. Social and collaborative learning can add value. If we can tokenise the value of learning, then we can have people earning to learn, and consequently, we will be able to include those who cannot afford education.

4.2. Dr Maria Vigliotti, Director, Gradbase

Gradbase essentially put academic qualification on the Blockchain. In the old days and now, we receive a paper as the certificate of our degrees. Blockchain would allow universities and other educational institution to insert a cryptographic digest of the data on the blockchain. It will enable employers and institutions to verify that that qualification was being inserted.

It seems a small change, but it is essential. First of all, because it touches something that is part of the fabric of society, employment, how we employ people and how we get people on employment and, fundamentally, it solves problems around education that need to be tackled, as a fraud.

Fraud. Fraud happens at different levels, and here is where blockchain is perfect for fighting against it. Blockchain enables to report trustworthy and verified records.

Only in the US, there are more fake PhDs than the real ones. A couple of years ago, The Times Educational Supplement published that some fake degrees from Oxford were issued in Oxford by a bunch of fraudsters.

University could think about deploying Blockchain networks for certificates as a risk management tool. Blockchain can bring down a lot of costs, bringing a lot of benefits not only to the university but also to the student.

The opportunity

Our students are changing; they are not only going around with a degree and frame it of their

bedrooms, but they also want to share it on social media. Students and universities have now the opportunity to have a digital qualification that can easily share through social media.

Employers have the opportunity to have these degrees verified very quickly. One of the biggest problems for employers is once they see these degrees, could they trust them? It is an important question.

We do not work only with academic qualifications; Blockchain can as well be applied to professional educational institutions, for example, continues development accreditation companies. If we think about how we learn and how we operate today, for example, a doctor typically needs to maintain a certain level of qualification and a number of professional experiences that they need to be certified to ensure that they have a certain level of skills.

There are various reasons why those things could either get lost or be somehow falsified. More importantly and very crucial element when the blockchains mainly include compliance. How to prove compliance, how do we know that a doctor has a degree, how do we know that a doctor has the right skills at that particular time?

Blockchain offers an excellent opportunity to the reduction of cost to prove compliance

Students, why would students want this verified qualification? We have recently been working with the university in Switzerland; we carried out an extensive study among students. Students are interested in digital qualifications. If the qualifications and the certifications do not represent the study and the effort, the certificates are meaningless for them. It is a devaluation of their professional life.

Having the opportunity to put a qualification on the blockchain provides assurance to students that the qualification is meaningful

Gradbase uses Blockchain to enable Universities to issue safe qualifications, to enable employers to verify qualification securely and to enable students to be very proud about their qualifications

Our platform brings together all the stakeholders, students, recruiters, employers, professional and educational institutions. Everybody has an opportunity to be at the same table, to see the data and to interact with the data in a meaningful way lowering the amount of time that the data needs to pass around and the cost, effectively turning problems into opportunities.

Challenges

Universities work in a very heavily regulated sector; they tend to be very cautious. The fear of universities is related to GDPR and privacy compliance; therefore, they do not want to give out data. Gradbase does not keep data in our database and has a straightforward way to comply with

GDPR.

However, the biggest problem that we are facing with universities. Why do education institutions want to operate with us? Because they can see the benefit that the candidates and the recruiter will have along with the benefits that bring to them in terms of compliance. However, Universities sometimes tend to want to do more but feel some kind of barriers; here is where the government could help.

If we look at finance which is also a heavily regulated environment, the FCA has set up sandboxes to test the technology. A sandbox is an opportunity to innovate; similar tools should be applied to the educational sector, an educational sandbox to test the technology in a safe environment.

Innovation and academia mean research; we have produced great things in the UK. However, the idea of innovating from the institution and organisation point of view is quite challenging. There is a tendency to do things in the same way they have been done.

There is not an idea of working together as a sector, universities are very particular organisations primarily in the UK, the sector is not entirely governmental, is not quite private, so it is a sort of there in between. The idea of operating together is about the force; it would be fantastic if the government would do a sort of education sandbox, where the universities can, from an operational point of view, innovate themselves.

In addition, there is a mandate from the Department of Education to enforce digitalisation because it means scalability of the services; however, there is not the same mandate to innovate. It would be vital not only for blockchain but for the future of the UK.

Putting qualifications on Blockchain is not only for the benefit of the university, but it is also for the benefit of the economy.

Having worked in Africa and West Africa, one of the biggest problems in immigration is always how to recognise the skills of the people, if the certification is not accurate or trusted. We are talking about really high-skilled people. The use of Blockchain to verify these qualifications would benefit the UK reducing the shortage of digital skills that we have

Our ambition is to create a trustworthy global registry, where Universities and recruiters can work together.

4.3. Oner Avara, CEO, My Next Match

On Sunday, the one hundred and twenty-fifth anniversary of the International Olympic Committee (IOC) was celebrated in Lausanne Switzerland, with the inauguration of their innovative technology savvy and eco-friendly Olympic house.

Hundred and twenty-five years ago, the forefathers of the IOC could not ever envisage the importance and necessity of sport to embrace technology

Today, sports organisations and federations are expected and mandated to embrace the accommodation of sports and technology. Insiders, specialists, and fans can see that there is still so much more which can be done to tackle logistical and governance issues through the sustained implementation of sports specific technology

Next year, between the twenty 4th July and the 4th August, we will witness the thirty-second Olympic Games, which will be hosted in Tokyo. Thirty-three sports and around 10,000 athletes are expected to compete in the most prestigious and inclusive sporting competition on the planet. These 10,000 athletes are the most elite athletes within their sport, with only the very best of the best chosen to represent their countries.

The concept of the competition and sports celebration has vastly evolved since its first inception in parallel with societal, scientifical, and technological advances.

Sports Hierarchy

National federations were established mainly in the late 19th and early 20th centuries in Europe. The primary aim was to harmonise varying sets of rules, equipment, and other logistics, allowing teams from different villages, towns, cities, and regions to compete against each other under the same parameters and conditions to create a so-called “level playing field.”

In each sport, the establishment of the International Federations followed soon after in response to a demand to compete for a nation versus another nation, internationally. The main aim was to ensure that individual contests, between teams and individuals from different nations and more generally competitions with international participation, could take place under a standard set of rules and be officiated by judges, referees, and umpires applying these same rules consistently

Over the past 30 plus years, the proliferation of competitions sanctioned or organised by the summer International Olympics alone has seen an exponential rise in their sanctioned events from 90 in 1970 to more than 8400 throughout Olympic quadrennial, 2013 to 2016, according to ASOIF data (Association of Summer Olympics International Federation).

The mission of the sports national governing bodies is to protect and defend the common interest of its members and develop the vision to position itself, as a provider of added value to its members and for the International Federations, sports, and Olympic movement.

In the fast-evolving world, sport is increasingly subjected to technological socio-economic and geopolitical political developments. All sports governing bodies must anticipate and be prepared to respond to these developments

A broad consensus exists that sports sector decisions are now influenced by a wide range of considerations, including social and technological changes, geopolitical issues, and national and regional legislation. This is accentuated by governments increasingly moving to address cross border challenges and a greater degree of involvement of business in the global sports sphere.

The three key actors in the sphere, governing bodies of sport, public authorities, and business interests will increasingly operate together in the same space and consequently at times compete against each other.

Challenges

Protecting the interest of society, sport and, athletes while allowing for the continued development and growth of a sector for which fans and society seem to have a limitless appetite.

The main challenge is to find a sustainable balance so that the interaction of these three groups optimises outcomes

In a structured hierarchy of the sport, there are teams, clubs, regional association, national associations, continental and International Federations. Before we saw the global problem, we need to look at it from the countries point, and the structure where there is a lack of trust or some kind of weakness.

What are the duties of national governing bodies? Governance, administration of competitions, development, integrity, medical, commercial delivery, technology, media, and communications.

To establish all the duties correctly and efficiently, they need to be able to communicate, in order to communicate, they need the technology.

When the communication is not established, whether it is through technology or other means, then the following problems occur, lack of trust within the hierarchy, inefficient membership, minimal marketing, lack of funds, lack of CPD, limited data for decision-making, limited data for monitoring health and safety, inadequate record-keeping, manual data entry, missing information due to record-keeping and the list goes on.

For example, if there is no historical medical footprint or historical medical data available for the athletes, it jeopardises the national governing bodies accountability, athlete's well-being, and overall, the sport itself. If there is no accurate record-keeping in place the athletes what teams can be mismatched and then that will give a wrong impression for the sport and most likely the athletes will be distancing themselves from the sport.

When we talk about technology, in particular blockchain, do not suggest Blockchain is a magical tool that will solve all the problems within the sports industry. However, there are approximately 60% of the processes, from recreational participation to IOC level, that will benefit from Blockchain, improving the efficiency without disrupting the current plans and executions.

"Sixty per cent of the sport processes will improve efficiency by blockchain."

My Next Match has developed specific tools to overcome national governing bodies current problems and help future projections, bearing in mind that the national governing bodies should comply to the rules and regulations, rules of the sport throughout the IOC and International Federation the downwards, and the aids with the commercial entities to monetary operations

In this room, we gather to discuss the revolutionary advantages of Blockchain. We are ahead of our time; we are visionary in our boats. However, it seems that the sporting world is still playing catch-up when it comes to technology, almost as if they can only progress at the rate where they are still one generation behind the most effective solution.

It seems that the sporting world is still playing catch-up when it comes to technology."

Even now, I witnessed the International Federations to, despite having the option of cloud-based technology, they prefer elicits their work through amounts of paper. Just recently I attended into more than 1,000 pieces of paper were printed throughout the competition, for both, technological and ecological perspective, we must move to educate sports organisations about this detrimental impact.

Blockchain will not be the full solution for most sports, but what cannot be denied is that it will be a massive improvement on the current procedure. Before this, we must find that exactly why despite a vast amount of current technologies be readily available for Federation's the majority continue to ignore this in favour of antienvironmental, unethical, and inefficient methods.

This lack of awareness is sure to affect the implementation of blockchain in the international sporting hierarchy.

We must find a way together on how to ensure that blockchain can overcome all barriers both logistically and financially so the technology can be regularly available for all.

APPENDIX – Speakers' Bios

Lisa Short, Director, Mind Shifting, Z School

Recognised as a visionary and multi-dimensional thinker who builds, connects, catalyses, and enriches global communities, ecosystems and resources that deliver solutions to global challenges. Neoteric thinking, challenging the state of play, and disrupting the norm whilst embracing the rapidly advancing potential of frontier technology such as blockchain keeps Lisa at the forefront of pioneering positive change impacting the future of work, future of learning and tech for good. Significant challenges require big solutions and never be afraid to deliver them is a mantra that drives Lisa forward.

Coined as a "Superwoman of Blockchain" Lisa is regularly engaged as an advisor to government and industry; as an international speaker, and for convening and delivering the message that action, not talk is crucial for the global economic environment to deliver growth, improve business, develop scalable, affordable education and advance frontier technology and women's leadership.

Current actions of change include a tokenised values-based economics parity index; technology ecosystems to revolutionise the business of education and deliver scalable, affordable learning; leading the development of a global education community in blockchain, and founding and leading the Mind Shifting Frontier TechEd Accelerator, a reverse accelerator that intersects mainstream businesses and their challenges with 'go to market' opportunities of early-stage blockchain & frontier technology start-ups.

Lisa's paradigms change must be in a world, where we achieve the Sustainability Goals and build our future together with international collaboration as one community, with parity across gender, age, education, innovation, and global citizenship.

Dr Maria Vigliotti, Director, Gradbase

Dr Maria G Vigliotti is a leading expert in computing with a vast experience in security, cryptography, blockchains, training in academic and non-academic environments. Maria is the CEO of Sandblocks Consulting, a company providing:

Blockchain executive training on coding The Ethereum Blockchain Blockchain requirements workshopsBespoken blockchain solutions security audits for smart contracts

Maria is the Chief Editor of the open-access journal Frontiers in Blockchain, Smart Contract section, a member of the Distributed Ledger Technology Committee of the International Standard Organisation (ISO/TC 307)

Maria holds a PhD in Computing from Imperial College London. She has several years of experience in formal verification of code for concurrent systems in safety, critical applications, industry and academia. She also worked on cryptographic attacks with The European Railway Traffic Management Systems (ERTMS), the European railway signalling system and the Cybersecurity strategy for the railway. Maria has published over thirty papers about international academic journals and conferences.

Oner Avara, CEO, My Next Match

An Avid sportsman and boxer, Oner is also an active co-founding member of All-Party Parliamentary Group on Boxing chaired by Chris Evans MP. Oner is passionate about encouraging the local youth and sporting clubs in Britain to engage in Boxing.

Oner's background as an amateur boxer has helped him approach business in a sportsmanlike manner.

Founded My Next Match, it is a technology company working in the sports sector who are revolutionising the organisation of amateur and recreational sports across the world with a platform that helps international, and national sporting federations govern their sports more effectively, protect their competitors' health, improve athletic performance and make finances more transparent.

When he is not working or travelling, he is usually with his two children who also are very active in several sports. He also enjoys running and practising Boxing in his boxing gym Left Hook Boxing Club in Shadwell".

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