ISSN 2764-6068

IJ LCW

International Journal of

Law in Changing World

Volume 1 Issue 2 December 2022

INSIDE THIS ISSUE

International Journal of
Law in Changing World
Volume 1 Issue 2 (2022) ISSN 2764-6068

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Chief Editors' Note

The International Journal of Law in Changing World: Introduction to the First Issue

Dear Readers,

The Second Issue of the International Journal of Law in Changing World is published.

We dedicate this Second Issue to international scientific cooperation in such an uncertain time. Science and research must speak not with the language of politics but with the language of knowledge dissemination and transfer. Therefore, we are delighted that this Issue is an example of international knowledge exchange. Authors from different parts of the world presented their papers on current law problems in South Africa, Russia, Brazil, Italy, Greece, and Malaysia.

Our authors gave the Journal the honor to publish papers devoted to different aspects of law and regulations that the modern world faces. This Issue presents the essay "Why Should the State Intervene in the Labour Market: The Case of South Africa." In it, Professor William Manga Mokofe (Eduvos University, South Africa) explores the best ways to protect workers in an ever-changing South African labor market characterized by poverty, unemployment, inequality, the growth of the informal economy, an inflow of migrants, the digitalization of the economy, and the impact of the Covid-19 pandemic.

The following paper is entitled "Smart Contract: Security Issues and Further Development in Brazil", by Luane Silva Nascimento and David Gabriel Dutra Martins (Universidade Católica de Brasília-Distrito Federal, Brazil), dissertates on how smart contracts are applied in the legal universe and demonstrates their advantages.

"Patients' personal data, including biometrics, as objects of criminal law protection", by Professor Albina A. Shutova (Kazan Innovative University named after V.G. Timiryasov, Russia), is devoted to criminal-legal issues regulation of patients' personal data constituting medical secrecy. The research objective is to assess the level of legal regulation of public relations, at which criminal encroachments are performed during personal data processing, and to improve Russian criminal law in this sphere.

"DNA evidence, new technologies and Justice's applications: an international comparative overview", by professors E. D'Orio, C. Lucanto, G. Francione (Bio Forensics Research Center, Italy), highlights, in a comparative manner, the current European and extra-European laws on the regulation of

Published December 2022
https://doi.org/10.54934/ijlcw.v1i2.34

genetic evidence. An in-depth focus on regulatory aspects and aspects of the new scientific methodologies and how their use can affect human rights, particularly regarding protecting citizens' basilar human rights.

"Criminal-Legal Protection of Robotics: Notion and Content", by Professor Ildar R. Begishev (Kazan Innovative University named after V.G. Timiryasov, Russia), proposes to interpret criminal-legal protection of robotics as an interconnected system of provisions shaping the criminal-legal policy in the sphere of development, production and application of robots, as well as the liability for socially dangerous infringements committed with the use of robots and concerning robots.

"The Evolution of the Simulated Signature by the Forger" by professor Pàvlos Kipouràs, (Research Advisor at the Department of Forensic Science, Criminal Procedure and Judicial Expertise at South Ural State University', 'Scuola Forense di Grafologia', 'Scuola di Grafopatologia Forense' 'Scuola Superiore di Perizie', Italy) it studies practical cases of signature modifications.

The Journal also contains a review of the book "The Shanghai Cooperation Organization: Exploring New Horizons" written by professors Saslina Kamaruddin (Sultan Idris Education University, Malaysia) and Muhammad Izwan Ikhsan (Universiti Teknologi MARA Sabah Branch, Malaysia).

We truly hope you will find this Issue valuable and informative because that is the mission of the Journal – to find solutions to crucial legal issues that arise from the forever-changing world.

We want to thank our authors, reviewers and editorial team members for their excellent job, support, and efforts to make the Second Issue happen, come what may. We hope the Journal can inspire academics and researchers to keep expanding their horizons and reducing the research distance between countries.

Sincerely yours

Editors-in-Chief

Elizaveta Gromova and Daniel Brantes Ferreira

Published December 2022
https://doi.org/10.54934/ijlcw.v1i2.34

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Research article
Journal Link: https://ijlcw.emnuvens.com.br/revista
DOI: https://doi.org/10.54934/ijlcw.v1i2.23

WHY SHOULD THE STATE INTERVENE IN THE LABOUR MARKET: THE CASE OF SOUTH AFRICA

William Manga Mokofe
Faculty of Law & Commerce, Eduvos, East London, South Africa

Article Information:

Received
September 15, 2022
Approved
October 20, 2022
Accepted
November 17, 2022
Published
December 29, 2022

Keywords:

intervention,
laissez-faire,
labour market;
government,
social justice
perspective

ABSTRACT

Labour remains at the centre of political, social, and economic discourse in South Africa. Two broad perspectives dominate the political discourse as to why the state should intervene in the labour market. The first is the *laissez-faire*, free-market model, and the second, known as 'social justice' – a concept generally used to justify government intervention and the distribution of resources – is a perspective that stresses the need for social justice in the workplace in a variety of ways. This article explores which of these views will best protect workers – referred to in the context of the inadequacy of the contract as a mechanism to regulate the employment relationship – in an ever-changing South African labour market characterised by poverty, unemployment, inequality, the growth of the informal economy, an inflow of migrants, the digitalisation of the economy, and the impact of the Covid-19 pandemic. The author concludes by supporting the view that upholds social justice in the workplace.

FOR CITATION:

Mokofe, W. M. (2022). Why Should the state Intervene in the Labour Market: The Case of South Africa. International Journal of Law in Changing World, 1 (2), 4-25. DOI: https://doi.org/10.54934/ijlcw.v1i2.23

1. INTRODUCTION

Unquestionably the world of work has changed since the 1970s (Owens, 1995) This is a global phenomenon and is a direct result of changed socio-economic circumstances (Slabbert, 2003, Fillipova, 2023). The change in socio-economic circumstances, in turn, is a direct consequence of technological advancement and development (Coyle, 1999). South Africa has also had to deal with the Covid-19 pandemic. The huge socio-economic and political changes that have taken place during the past decades and the digital developments in South Africa have had a crucial influence on the South African labour-law dispensation (Brassey, 2000). In South Africa, labour law remains at the centre of political, social, and economic discussions on the nature and extent of labour market regulation. Two broad perspectives influence the political discussion as to why the state should intervene in the labour market. The first is the *laissez-faire*, free-market model and the second, is the social justice perspective that stresses, in different forms, the requirement for social justice (Davies, 2004) in the workplace. Certainly, there are different forms within each view, diminishing membership of trade unions (trade unions being regarded as the main channel through which to achieve social justice), and reduced collective bargaining power, which is the voice and mainstay of workers point to a shift in labour-power dynamics. In an era characterised by new forms of work and the digital economy, there is a need for the government to intervene in and regulate the labour market.

It is against this backdrop that this study seeks to determine why the state must intervene in the South African labour market to protect vulnerable workers who are often inadequately protected and other challenges impacting the labour market that require state intervention. The author argues that while there has been some legislative effort and other state endeavours to comply with obligations flowing from the Intentional Labour Organisation (hereafter ILO) Conventions and the South African Constitution to regulate the labour market, more remains to be done.

The following text focuses on the inadequacies of the common law in South Africa, challenges facing the South African labour market, the socio-economic environment, the effects of the Covid-19 pandemic on the South African economy, labour migration and precarious employment in South Africa, the informal economy, new forms of work, the libertarian model, and the social- justice model.

https://doi.org/10.54934/ijlcw.v1i2.23

2. INADEQUACIES OF THE COMMON LAW IN SOUTH AFRICA

Statutory intrusion into the common-law of employment was influenced by a general realisation that the law had fallen behind conditions in modern commerce and industry and not long ago, by recognition of fundamental human rights and their entrenchment in national constitutions (Constitution, 1996). It was recognised that freedom of contract was ill-suited to the collective relationship between employers and the unionised workforce that spread throughout the industrialised world in the nineteenth century (Grogan, 2011). In particular, the common law did not cater for the inherent inequality in bargaining power between employers as the owner of the means of production, and employees who were entirely dependent on supply and demand for their welfare and job security (Marais, 1995).

The common law also disregards the enduring nature of the employment relationship; it gives employees no legal right to demand better conditions of employment as time passes. By emphasising freedom of contract, the common law encourages or at least does not discourage, the exploitation of workers. Nor does the common law give workers any say in those management decisions which directly affect their working conditions and legitimate interests. Finally, the common law provides no effective protection for the security of employees (Brassey, 1987).

While market forces and competition may to some extent help to ensure that employees receive a return on their labour, in most cases employees need work more than the employer needs the services of particular individuals. This is especially true of those who enter the labour market without special skills, particularly in times of high unemployment. The unequal, often pre-contractual, bargaining relationship between aspirant employees and employers tempts unscrupulous employers to employ people under onerous conditions and at exploitative wages (Grogan, 2014).

3. CHALLENGES CONFRONTING LABOUR LAW IN SOUTH AFRICA

South Africa is an upper-middle-income state confronting serious structural economic challenges born, to a large extent, of the apartheid past which continues to define the country's socio-economic environment. The discussion in this article requires a brief synopsis of some of the challenges facing the South African labour market. From precarity to digital disruptions and the Covid-19 pandemic, South Africa has major socio-economic tasks to address.

https://doi.org/10.54934/ijlcw.v1i2.23

3.1 Socio-economic environment: Poverty, income inequality, and unemployment

Poverty, inequality, and unemployment continue to be the greatest challenges facing South Africa. To elaborate on the point, the results of the Quarterly Labour Force Survey (Quarterly Labour Force Survey - Q2:2022) indicate that 648 000 jobs were gained between the first quarter of 2022 and the second quarter of 2022. The biggest job gains were recorded in Community and Social Services (276 000), Trade (169 000), Finance (128 000) and Construction (104 000). However, there were job losses in Manufacturing (73 000) and Transport (54 000). The total number of persons employed was 15,6 million in the second quarter of 2022.

The number of unemployed persons increased by 132 000 to 8,0 million in the second quarter of 2022 compared to the previous quarter. The number of discouraged work-seekers decreased by 183 000 (4,9%) and the number of people who were not economically active for reasons other than discouragement decreased by 452 000 (3,3%) between the two quarters resulting in a net decrease of 635 000 in the not economically active population.

The above changes in employment and unemployment resulted in the official unemployment rate decreasing by 0,6 percentage points from 34,5% in the first quarter of 2022 to 33,9% in the second quarter of 2022 – The unemployment rate according to the expanded definition of unemployment also decreased by 1,4 percentage points to 44,1 % in Q2:2022 compared to Q1:2022.

The results continue to show that youth remain vulnerable in the labour market. The second quarter of 2022 saw the total number of unemployed youth (aged 15-34) increase by 2,0% (or 92,000) to 4,8 million from Q1:2022. There was a noticeable increase of 7,2% or 370 000 in the number of employed youth during the same period. The increase in both employment and unemployment among the youth resulted in a decrease in the youth unemployment rate by 1,3 percentage points to 46,5% in Q2:2022.

Despite the drop in unemployment, the rate is still the highest on a list of 82 countries and the eurozone monitored by Bloomberg (Bloomberg, 2022). The International Monetary Fund Projects South Africa's unemployment rate will reach 35.2% this year, the highest in the world, though data for some countries is unavailable (United Nations, 2022).

The average Human Development Index (HDI) value for South Africa in 2022 was 0.709 points, leaving it in 114th place in a table of 189 countries published by the United Nations, which places it in the

https://doi.org/10.54934/ijlcw.v1i2.23

medium-human-development category. The HDI is made up of three components of human development: longevity; education level; and living standard. The HDI indicates that many South Africans are living below the international poverty line.

South Africa remains one of the most unequal countries in the world. Linked to the high levels of poverty in the country, South Africa has a global score of 63 in income inequality – the highest in the world – in terms of the "Gini coefficient" which analyses the distribution of income among individuals and households.

3.2 Effects of the Covid-19 pandemic on the South African economy

The Covid-19 pandemic has had and continues to have, serious consequences for the South African labour market with many families earning little or no income. Estimates by the ILO show that assuming a situation without alternative sources of income, lost labour income will increase relative poverty for informal workers and their families by more than 56 points in lower- and low-income countries. (ILO Monitor, 2021). This includes workers in sectors such as accommodation and food services, manufacturing, wholesale, retail trade, and many more. Because those in the informal economy needed to work to survive, lockdowns and other containment measures were a source of social tension and led to the transgression of regulations which, in turn, endangered the government's efforts to protect the population and fight the pandemic (ILO, Covid-19, 2021). Furthermore, logistic challenges within supply chains – in particular, cross-border and domestic restrictions on movement – led to disruptions in the food supply which undermined precarious workers' food security (ILO Covid-19, 20201). One can only be thankful that for the present at least, lockdown and stringent measures are a thing of the past.

As part of its report, the UN notes that the socio-economic consequences of the Covid-19 pandemic – which has led to more than two million job losses in South Africa alone – will likely intensify inequalities and cause the number of citizens languishing below the international poverty line to increase (United Nations, 2022).

Informal food markets play an essential role in ensuring food security in South Africa, both as a source of food and as a place for smallholder farmers to sell their produce. When lockdown and stringent measures were imposed in South Africa at the start of the Covid-19 pandemic, many South Africans doing business in the informal sector such as street vendors, home-delivery workers, etcetera, were unable to operate. This led to food insecurity. Thanks to the vaccination program and other health measures

https://doi.org/10.54934/ijlcw.v1i2.23

introduced in South Africa to curb the pandemic, lockdowns are now a thing of the past and businesses are now operating normally.

For many South Africans doing business in the informal sector, their homes were their workplace and given the conditions described above, most workers in the informal economy – and particularly migrant workers – were very exposed to occupational health and safety risks, lack of appropriate protection, and an increased likelihood of illness, accident, or death. Covid-19 added to these risks; if they fall ill most workers, including migrants, (ILO Covid-19, 2020) have no guaranteed access to medical care and no income security in the form of sickness or employment injury benefits. As we study the effects of the pandemic on precarious workers, we must consider the additional challenges posed by new forms of work.

3.3 Labour migration and precarious employment in South Africa

Another challenge facing the South African labour market is extensive labour migration. The late nineteenth century saw a huge number of migrant workers employed in certain economic sectors in South Africa – particularly in the mining and commercial agriculture sectors. Workers came from Botswana, Lesotho, Malawi, Mozambique, Zambia, Zimbabwe, and Swaziland. South Africa remains southern Africa's most powerful and diverse economy and continues to attract the largest number of both formal and informal migrant labourers. Today, migrants not only come to South Africa from the states mentioned above but also from the entire African continent and the world over.

Since 1990 the number of labour migrants relocating to South Africa has increased. There are several explanations for this, including growing unemployment in the transfer states and decreasing government contributions to social services (ILO Labour Migration, 1990). Currently, the main reasons for migration include the huge differences between southern African states as regards income, standards of living, levels of unemployment, and political instability (Crush et al., 2005).

As observed by Mpedi and Smit, migrants can be divided into two main groups: documented migrants (permanent residents, temporary residents, refugees, and asylum-seekers); and undocumenteded migrants[1] Documented migrants are those who enter the state lawfully and have the host state's official authorization to work within its territory. Consent to work is granted based on an employment proposal

https://doi.org/10.54934/ijlcw.v1i2.23

from an employer who must justify the need to employ a migrant based on his or her knowledge, abilities, skill, and proficiency in a specific profession (Mpedi & Smit, 2011).

Because South Africa closely scrutinizes applications for permission to allow migrants to work, applications are made only by establishments that are lawfully registered and comply (at least on the face of it) with the legislation regulating employment relations. Therefore, it is likely that most documented migrant workers work under favorable conditions like those of their indigenous colleagues. They have greater bargaining power and may rely on the protections afforded by labour legislation.

Notwithstanding, apart from workers who have permanent resident status, it is difficult for migrant workers to access state social security protection such as disability and unemployment insurance benefits (Dupper, 2007). The latter are workers who enter and work in the state illegally, or who enter legally (on a premise other than work) and remain in the host state and work without permission. They generally lack the education or skills that would justify the issuing of a work permit. They choose to work in jobs where they can escape the attention of the public authorities and, consequently, their choices are limited (ILO Decent Work and the Informal Economy, 2002). This means that they are susceptible to exploitation and abuse and will accept work where the circumstances and conditions are substandard, the wages low, and where there is little or no job security (Fenwick et al., 2007).

In addition, undocumented migrants are always vulnerable to substandard living and working conditions, live in fear of being deported, and are generally excluded from the social protection provided by the state (Dupper, 2007). There is a clear link between precarious employment and vulnerable workers. The problems facing precarious work are exacerbated by the concentration of vulnerable workers, including migrants, the youth, the elderly, and women, in many of these jobs.

Migrants frequently work in the informal economy – agricultural harvesting and construction labour forces – and perform undeclared work. The youth and undocumented immigrants are particularly in peril because of their economic dependence, the absence of assistance, and their fear of lodging complaints with the regulatory authorities (McLaurin & Liebman, 2012). Migrants generally engage in hazardous work and also work in sectors in which precarious employment arrangements are commonplace (Rizvi, 2015). Many studies have failed to examine these correlations, a notable exception being the study on hotel housekeepers (Seifert & Messing, 2006). Because of their precarious position, migrants cannot benefit from the protection afforded by labour laws. Many migrant workers have no form of social

https://doi.org/10.54934/ijlcw.v1i2.23

protection while working in South Africa (Olivier & Kalula, 2007). Migrant workers, particularly those who are undocumented, thus find themselves in conditions akin to precarious employment.

3.4 The informal economy

According to statistics South Africa, Quarterly *Labour Force Survey* (*QLFS*) in Quarter 1 of 2021, there were 2,9m South Africans employed in the informal sector (excluding agriculture), but these data do not indicate how Covid-19 may have impacted informal enterprises.

The informal economy sector in South Africa has a tiny, yet notable, total share of employment, with an increase in the *informal sector* employment in Quarter 4 of 2020 by 65 000 workers, (Statistic South Africa, 2022) The informal sector has invariably been deemed a temporary shield for the poor (Mohlakoana, de Groot, Knox, Bressers, 2019).

It is worth noting that in South Africa the formal economy is not all-inclusive, rather it has vast discrepancies regarding inequality and excludes most of the black people who are impacted by soaring levels of unemployment and poverty (Ndulo, 2013). This has propelled many poor South Africans into marginal circumstances and compelled them to create survival plans which include participating in the informal economy (Skinner, 2016). This sector has persistently and permanently shown growth everywhere in the country. Despite these vulnerabilities, informal economy workers in South Africa are not typically covered by social protection programs.

This lack of social protection contributes significantly to the vulnerability of this category of worker. The absence of at least a basic level of income security traps many of these workers in a vicious cycle of vulnerability, inequality, poverty, and social exclusion. This constitutes a huge challenge to their well-being and enjoyment of human rights, in particular, the right to social security. In light of these vulnerabilities mentioned in the above paragraph and limited ways of assessing the needs of the informal sector as evidenced in the Covid-19 pandemic, the South African government needs to revisit its social protection programs.

3.5 Informalisation of work in South Africa

The growth in non-standard work (i.e., employment that differs from the conventional or standard work relationship where work is generally full-time and anticipated to continue until standard retirement age, or until either party gives notice of termination), often gives rise to informalisation in South Africa

https://doi.org/10.54934/ijlcw.v1i2.23

(Mills, 2004) and the separation of the worker from his or her place of work. Features such as globalisation, socio-economic and technological developments, and amendments to legislation to adapt to increasingly competitive surroundings, have added to the informalisation of the workplace in South Africa (Theron, 2003).

This process of informalisation, by which workers are obliged to move from conventional employment to the informal economy results in deregulation; workers move beyond the protective scope of labour law (Fenwick et al., 2007). Informalisation in the South African context relates to the situation where "employees who are *de jure* covered by labour law but who are *de facto* not able to enforce their rights, as well as to those employees who are *de jure* not covered by the South African labour law because they are independent contractors"(Fenwick et al., 2007).

3.6 New forms of work and the future world of work

Disruptive technological changes and increasing socio-economic imbalances have recently impacted the entire world (Du Toit, 2019). The fourth industrial revolution (4^{th} IR) is characterised by the blending of the digital, physical, and biological worlds, as well as by an increasing application of novel technologies such as artificial intelligence, robotics, and wireless technologies. These developments have heralded a new period that has accelerated the process of disruption by making room for new forms of precarious work (Du Toit, 2019). Notwithstanding the positive results that technological developments may have had on the economy and the growth in new jobs, they have also had negative results.

Convoluted networks make the problem of identifying the parties to the employment relationship an international concern (Du Toit, 2019). In the words of Weiss, "digitalisation contains many risks but it also is a chance to improve working and living conditions to the benefit of workers. It is not an apocalyptic evil but something which needs to be shaped." The question regarding digitalisation is, to couch it in a somehow simplistic formula, whether labour law, the legislator, and the collective actors will succeed in ensuring that human beings will not become slaves to this new technological phenomenon (Weiss, 2020).

Labour and social security protection are accessed through an employment relationship. However, the nebulous line that separates the situation where there is an employment relationship and that where there is independent contracting has been a matter of discord.

https://doi.org/10.54934/ijlcw.v1i2.23

The application of labour law in its narrowest sense does not include either the self-employed or independent contractors. As a result, persons engaged in modern forms of work, such as on-demand platform work, may not be viewed as employees and as such do not fall within the safety net of labour law (Du Toit et al, 2019). However, the government has a very significant role to play in addressing the situation as illustrated in the NMWA. This Act applies to all workers and their employers and given that the expanded definition of a worker includes "any person who works for…", the Act covers "independent contractors" – including casual labourers – who personally undertake to perform work or services. The NMWA has been positioned as an active policy response to some of South Africa's most urgent concerns. Income inequality has risen since 1994, household poverty levels remain stubbornly high, low wages pervade the labour market, and private sector union membership has tumbled (Development Policy Research Unit).

Although data from research on NMWA conducted by (Bhorat, Lilenstein, & Stanwix, 2020) suggest that the effects of the law, at least in the short term, have been far more moderate than expected, the majority of workers' hourly wages do not appear to have increased substantially. Accordingly, at the end of 2019 levels of non-compliance with the NMWA are relatively high, although not significantly different from aggregate non-compliance with the Sectoral Determination Minimum Wages in the past. Specifically, at the national level, 43,5% of workers reported earning wages below the National Minimum Wage at the end of 2019. This notwithstanding, the author contends that the implementation of the NMWA remains the best avenue by which to address South Africa's poverty, unemployment, and inequality and that it is too soon to view this as a dysfunctional policy.

The digital-platform economy, typified by online suppliers of goods and services such as Uber, represents a vital stage in this development. The question is whether the reversal of the eroding effect of new forms of work, such as Uber, lies solely in broadening the definition of employee. Uber drivers in South Africa, like their counterparts in many other countries, have attempted to access labour-law protection through the gateway of classification as employees.

In *Uber South Africa Technology Services (Pty) Ltd v NUPSAW and SATAWU obo Tsepo Morekure*, the Commission for Conciliation, Mediation and Arbitration (CCMA) held that Uber drivers whose services were "deactivated" were employees in terms of the LRA. However, in a disappointing development, the South African Labour Court upheld an application for review and concluded that the CCMA commissioner had conflated the roles of Uber SA and the foreign mother company, Uber BV. The

https://doi.org/10.54934/ijlcw.v1i2.23

drivers had not contracted with the applicant (Uber, SA), and so could not succeed in their case. The question remains open whether Uber drivers will be classified as employees of Uber BV.

The future world of work can unlock opportunities, improve the quality of working life, and bridge the gap between citizens when it comes to socio-economic inequalities. It can, however, also lead to a reduction in the workforce. As a result, the Director-General of the ILO established the Global Commission on the Future of Work. The Global Commission's report calls for a human-centered approach to the future of work. The idea is to place people and their work "at the center of economic and social policy and business practice."

This approach is forward-looking and aims to develop humans to cope in a digital world and at strengthening social dialogue to improve employees' quality of working life. The report contains three pillars: the promotion of investment in people's capabilities; investment in the institutions of work; and investment in decent and sustainable work (ILO Global Commission on the Future of Work, 2019). As is shown below, the struggle to regulate new forms of work and achieve social justice and workplace democracy lies at the heart of the ILO's goals. After investigating the socio-economic situation in South Africa amid the Covid-19 pandemic and the 4th IR, it is crucial to explore some of the views advanced in the academic literature.

4. THE LIBERTARIAN OR FREE-MARKET MODULE

Have The libertarian or free-market model regards the contract of employment and the individual bargaining that it represents as the only lawful mechanism by which to regulate the employment relationship. Advocates (Friedman, 1997) of this approach regard labour legislation with the contempt generally reserved for an invasive plague such as the Covid-19 pandemic, an unwanted trespasser occupying the indigenous countryside of the common law and imposing unjustified regulation on the freedom to contract on similar or equal terms in the marketplace. They contend that legislation calculated to protect employees has the unforeseen result of protecting the employed at the cost of the unemployed. They further contend that any statutory regulation of the labour market conflicts with what is referred to as a "right to work under any conditions" (Friedman, 1997). This suggests that the real option for

https://doi.org/10.54934/ijlcw.v1i2.23

policymakers is between permitting employees to work under any circumstances they are willing to accept and compelling them to be unemployed against their will.

In terms of this view, the only lawful protection for employees is afforded by the effective and adequate common law and the resulting sellers' market in which employers are required to compete for labour by offering ever-better terms and conditions of employment (Brassey, 2012). Libertarians contend that getting rid of labour legislation will thus have beneficial results for employees and society at large.

A parallel, more sophisticated, contention for deregulation of the South African labour market assumes linkages between inferior labour standards and competitive advantage in the world market. Those who opt for removing restrictions and regulations frequently draw comparisons with other economies, especially those in developing countries, which seek to compete for access to global markets and investment through a form of labour market deregulation that requires a significant reduction in labour standards. This approach stresses the individual contract of employment (as opposed to any form of collective employment) as the best means for ensuring the greatest possible degree of flexibility and competitiveness.

While deregulation has had a profound effect on labour law in numerous jurisdictions, there are many reasons why this approach is inappropriate for any re-examination of labour market regulation in South Africa (Brassey, 2012). It is increasingly apparent that there is no empirical evidence to support the view that gains in trade performance or foreign direct investment (FDI) are related to inferior labour standards. The ILO core labour standards do not play a significant role in shaping trade performance (Lee, 1998). In other words, there appears to be no comparative advantage to be had from the denial or violation of core labour standards.[2] Research indicates that the contrary is true. A study into the link between labour standards and competitiveness came to the following conclusion:

> Against the race to the bottom hypothesis, the analysis did not find notable linkages between export performance or FDI inflows and the measures of labour standards. In short, the paper finds no proof that states with lower standards gained a competitive advantage in global markets. Poor labour conditions usually diminish productivity or are an element of a package of national characteristics that discourage FDI inflows or inhibit export performance (Flanagan, 2003, p.17).

https://doi.org/10.54934/ijlcw.v1i2.23

This is not to suggest, however, that there is no link between inflexible labour markets and the stifling of job creation. On the contrary, a co-publication by the World Bank and the International Finance Corporation quotes a study which suggests that the employment rates in OECD countries with flexible labour laws are 2 to 2,5% higher (World Bank, 2006).

Apart from labour economics, there are numerous external limitations on the nature and extent of any deregulation of the South African labour market. These include the fact that South Africa is a member of the ILO. Since the dawn of democracy in the country, South Africa has ratified all of the ILO's core conventions. Accordingly, it has incurred international law obligations to uphold the right to freedom of association, promote collective bargaining, ensure equality at work, and eliminate forced labour and child labour. The collection of labour law reforms introduced in South Africa in 1995 was specifically crafted to anticipate the ratification of the core ILO conventions and thus South Africa's international law obligations. South Africa is also bound by the ILO's *Declaration on Fundamental Principles and Rights at Work* and adopted by the International Labour Conference in 1998. The *Declaration* provides that by acceding to the ILO's constitution, the member states are obliged to observe the principles central to certain core conventions.

Furthermore, South Africa is a constitutional state which recognises labour rights, in particular the right to fair labour practices, as fundamental rights (Constitution, 1996).

5. SOCIAL JUSTICE DEFINED

Social justice is a well-established concept used to justify government intervention and the distribution of resources. It is a policy that is intellectually substantial, being based in its modern form on the Rawlsian theory of justice. It has been defined as "the common good through the equalization of goods or services" (Sadeghi & Price, 2007) and further as:

> The fair distribution of opportunities, rewards, and responsibilities in society, as well as principles and institutions for the distribution of meaningful social goods – income, shelter, food, health, education, and the freedom to pursue individual goals (Hudson, 2013, 432-433).

Social justice is also defined as the fair and equitable distribution of power, resources, and obligations in society to all people, regardless of race or ethnicity, age, gender, ability status, sexual

https://doi.org/10.54934/ijlcw.v1i2.23

orientation, and religious or spiritual background. Basic principles underlying this definition include the values of inclusion, collaboration, cooperation, equal access, and equal opportunity. Such values are also the foundation of a democratic and egalitarian society.

These definitions reflect the aspiration for social justice through which every working man and woman can based on equality of opportunity, freely claim their fair share of the wealth they have helped to generate. The importance of achieving social justice in South Africa is ever more pressing with the rise in inequality and exclusion, which is a threat to social cohesion, economic growth, and human progress in a world of work that is changing at an unprecedented pace and scale.

6. NEXUS BETWEEN SOCIAL JUSTICE AND LABOUR RIGHTS

There is a crucial link between social justice, labour rights, and well-being. For individuals, the absence of justice often represents increased physical and emotional suffering as well as greater vulnerability to illness. Furthermore, issues of social justice and access to resources are inexorably tied to the collective well-being (eg, relationships and political welfare) of families, communities, and society.

Provision of the opportunity to work for its people and providing them with access to labour justice are important aspects of the social justice responsibility of any state. This is particularly true in a country like South Africa where poverty, inequality, unemployment, and under-employment are rife. The South African workforce is exceptionally vulnerable to exploitation at the hands of inherently more powerful employers (Kahn-Freund, 1972).

The individual contract of employment cannot challenge the unilateral rationality of managerial prerogative. This gives rise to the need to allow labour to unite, form collectives, and strive to alleviate poverty on its own. Unionisation and collective bargaining lie at the root of most labour-relations issues.

Social justice is important because it represents the notion that justice does not have to be achieved through a set of abstract legal rights which bear scant relation to the experience of the society at large. Justice can be achieved through the consideration and involvement of different social groups in the design and application of the law. Social justice means that the law can be expanded to meet social compromises and should not be constrained by the liberal commitment to non-intervention and the free-market model.

https://doi.org/10.54934/ijlcw.v1i2.23

This created space in 1994 for the development of labour law to meet social compromise during the dawn of democracy in South Africa. New legal forms emerged which recognised the interdependent interests of employers and workers and a need to coordinate these in the greater "public interest" (eg, social insurance against industrial accidents in the OHSA and collective bargaining). A more contemporary social-justice perspective might, therefore, acknowledge collective bargaining as an important means of defining and enforcing protection for workers but recognises rights as a contemporary, and perhaps more significant, medium by which to promote social justice in the workplace.

To a certain extent, the creation and development of the ILO is a good example of this social moment. The Organisation was formed in 1919 as part of a broader peace project at the end of the First World War (Hendrickx, 2012). Its constitution explained the importance of social justice in realising this mandate and the importance of the creation of labour standards in the achievement of social justice (Preamble to the ILO constitution).

A commentary on the seven policy concerns in the constitution identified three priorities for the ILO as regards "social justice." First was the concern with work as a source of livelihood and fulfilment; the second was the goal of preventing exploitation (e.g., by limiting hours of work and "taking measures to protect those who might be particularly vulnerable") and the third was the need to protect workers against the difficulties of working in dangerous or inadequate environments (Rodgers et al., 2009).

Social justice thus required a redistribution of power from employers to workers, but it also meant the recognition of the value of work to both workers and the social system as a whole.

Given the social value of work, social justice represented the idea of the quality of work. It was understood that this recognition guarded against the treatment of labour merely as a commodity or an article of commerce and ensured that global industrial peace could be maintained.

Increasingly, however, labour law theorists came to be persuaded of the value of labour law in helping to equalise the unequal power-relation between employers and workers. A role was recognised for the law in limiting the "duty" of obedience of the worker and increasing the "range of his freedom" (Kahn-Freund, 1983).

https://doi.org/10.54934/ijlcw.v1i2.23

The constitutionalization of labour rights in South Africa implies that social justice is a prerequisite for ensuring a durable economy and society, and places obvious limitations on the policy choices open to those who pursue the regulation of the labour market.

7. A SOCIAL-JUSTICE PERSPECTIVE

Social The social-justice perspective on labour law views law as an instrument to further the interests of social justice. It centres on what Hugh Collins has termed the role of labour law in "setting the distribution of wealth and power in society" (Davies, 1997). Proponents of social justice can seek to achieve their goals and address some of the challenges facing South Africa mentioned above through a wide range of peaceful means, including various government programmes, social campaigns, and public activism.

At the government level, social-justice initiatives can be pursued through various types of programmes. These can include direct redistribution of wealth and income; protected legal status in employment and government subsidies.

While we must applaud and acknowledge South African legislation[3] which endeavours to address the common-law deficiencies and favours the following three methods to redress the inherent inequality between employers and employees: a) to impose minimum conditions of employment for employees generally or for particular classes of the employee; b) to promote the concept of collective bargaining; and c) to develop special tribunals to create equitable rules for the workplace which have the power to enforce those rules. The author argues that much still needs to be done in the form of the implementation of a permanent basic-income grant in South Africa to assist in reducing inequality.

Furthermore, the government should intervene in the markets to address inefficiency. In an optimally efficient market resources are allocated to those who need them in the amounts they need. In an inefficient market, like that of South Africa, this is not the case; some have an excess of resources, others insufficient resources. The government can combat these inequities through regulation, taxation, and subsidies. The South African government can further intervene to promote social welfare and directly

https://doi.org/10.54934/ijlcw.v1i2.23

address these issues. It is worth noting that the South African government must be applauded in this regard in light of the Social Relief Grant of R350 allocated to qualifying South African citizens.

The South African government can also intervene to minimise the damage caused by naturally occurring economic events. Recession and inflation are part of the natural business cycle but can have a devastating effect on citizens and migrant workers the majority of whom do business in the informal economy and barely eke out a living. In these cases, the government can intervene through subsidies and manipulation of the money supply to minimise the harsh impact of economic forces on its constituents.

Further, modern, and socially progressive labour legislation has significant social and economic benefits for employers, workers, and society at large. Such legislation, if well administered, supports a fair, predictable, and stable labour market, reduces industrial unrest, and enables businesses to grow with confidence and create new and better jobs. For example, if the government were to regulate the informal economy, many social benefits would accrue to South Africans operating in the sector. In addition, labour law must, through state institutions, guarantee the full implementation of national legislation promoting equality in the labour market and must be inclusive and extend to all people active in the South African labour market, irrespective of their employment status. Furthermore, the state must strengthen the role of labour inspection as part of its primary duty to protect workers. In this regard, migrant workers who ply their business in the informal sector, for example, must enjoy the same protection as their South African counterparts.

The provision of education and training schemes by the South African government is perhaps the most important type of government intervention required. This provides a better-skilled workforce to increase labour productivity and overcome market failure. In addition, to academic education, there is a strong case for the South African government to provide more vocational training and support for apprenticeships which will help to bridge the skills gap in the economy and overcome market failure in the under-provision of training schemes for workers.

Furthermore, one of the first paradigms developed within the social justice view regarded trade unions as the main channel through which to achieve social justice. In the words of Kahn-Freund:

[T]he relationship between an employer and an isolated employee or worker is typically a relation between a bearer of power and one who is not a bearer of the condition of subordination, however, much

https://doi.org/10.54934/ijlcw.v1i2.23

submission and subordination may be concealed by that indispensable figment of the legal mind known as the "contract of employment". The main object of labour law has always been, and will venture to say will always be, to be a countervailing force to counteract the inequality of bargaining power which is inherent in the employment relationship (Kahn-Freund, 1972, p.8).

Written in the 1950s, this is the most widely repeated statement on the purpose of labour law. It has been repeatedly cited in articles, textbooks, and judgments, including the Constitutional Court's judgment in *Sidumo v Rustenburg Platinum Mines Ltd*, which describes the passage as a "famous *dictum*".

Kahn-Freund advanced the idea that the purpose of labour law is to maintain an equilibrium between employers and workers, a purpose best achieved through voluntary collective bargaining (Davies & Freedland, 1983). In terms of this approach, law plays a secondary role – it regulates, assists, and constrains the power of management and organises labour law, but leaves the process of bargaining and its results to be determined by the interests and power of the parties themselves. However, the British system of collective labour relations on which Kahn-Freund premised his structure of labour law, soon came under pressure. By the end of the 1970s, Kahn-Freund himself expressed the view that the system he had called "collective *laissez-faire*" needed adjustment (Davies & Freedland, 1983).

Subsequently, in international terms, trade union membership has declined significantly, and collective bargaining is no longer the important social institution it once was. In these circumstances, employees are less likely to have their terms and conditions determined by collective agreements and are less able to rely on trade unions as agents to monitor and enforce those agreements.

Darcy du Toit has noted the ramifications of these developments:

If collective bargaining depends on effective worker organisation, it may seem to follow that the decline of trade union density, reflected in declining bargaining coverage, spells the demise of collective bargaining. If so, it might seem that labour law should shift its focus to new forms of worker organisation and new forms of collective interaction (Du Toit, 2007, p. 1404-1435).

One of the key reasons for the decline in the influence of collective bargaining as a social institution is that bargaining is more successful in a localised market. The opening-up of markets beyond the realm of union organisation and beyond nation-states has meant that collective bargaining has become progressively unable to promote workers' interests effectively (Brown & Oxenbridge, 2004) A possible

https://doi.org/10.54934/ijlcw.v1i2.23

response is to develop collective bargaining at an international level and to encourage what has been termed "framework agreements between international trade union federations and multinational enterprises". How collective bargaining might develop to deal with these issues, and how trade unions will adapt their strategies to meet new challenges, are questions that will no doubt increasingly occupy the thoughts of labour lawyers (Du Toit, 2007).

A more modern view of social justice might, therefore, acknowledge collective bargaining as an important means by which to define and enforce protections for workers, but also recognise rights as a contemporary and perhaps a more significant medium for the promotion of social justice in the workplace.

While rights might serve the primary function of protection, they are not absolute and may often need to be balanced against the competing rights of others, including the employer and third parties. The role of dispute resolution institutions, particularly the Commission for Conciliation, Mediation and Arbitration (CCMA) and the labour courts, is thus fundamental. Courts provide the primary mechanism through which labour rights can be assessed and, where necessary, balanced.

8. CONCLUSIONS

This article has explored the socio-economic environment and why the state should intervene to regulate the labour market in South Africa. Why the state should intervene or whether a *laissez-faire* approach – the free-market model – should prevail is a matter of contention in South Africa. However, given the nature of the changing world of work and new forms of work that continue to emerge, the question remains relevant.

Although South Africa has made considerable strides toward improving the well-being of its citizens since its transition to democracy in the mid-1990s, this progress is slowing. In many ways, the legacy of apartheid endures. Previously disadvantaged South Africans held fewer assets, have fewer skills, earn lower wages, and are still more likely to be unemployed.

A socio-economic environment characterised by poverty, unemployment, inequality, increasing labour migration, a growing informal economy, the digital economy, and the impact of the Covid-19 pandemic, has created an unsustainable situation that compels the author to support proponents of the social-justice approach. The author suggests that without government intervention (eg, by providing a

https://doi.org/10.54934/ijlcw.v1i2.23

blanket minimum-wage grant to those impacted by the above circumstances), any meaningful change to the current negative socio-economic environment will remain elusive.

The author suggests that, given that the primary objective of any enterprise in a free-market economy is to make a profit, the struggle against poverty, unemployment, and inequality cannot be resolved by the free-market model. In many cases, enterprises may sacrifice worker safety, environmental standards, and ethical behaviour in the service of profit margins. A market economy is defined by cut-throat competition and there is no mechanism to help those who are inherently disadvantaged, such as the poor and the unemployed. Without intervention by the state, the socio-economic gap between the haves and the have-nots will widen. Therefore, the government must intervene and implement a permanent social-security grant for all South Africans to level the playing field. In this regard, we must applaud the government for enacting the NMWA.

The inequality rate in South Africa is deplorable. Individuality must give way to social justice as regards the distribution of wealth, opportunities, and privileges within a society, especially in a country with a unique history of perpetual exploitation by the white minority under the apartheid regime. To achieve this, trade unions must be renewed and re-energised and the state must also play a crucial role in determining a minimum wage for all workers, and a social grant for its citizens. If the government fails to intervene and regulate the labour market in some measure and allows the *laissez-faire* model to flourish, inequality in South Africa will become still more entrenched.

REFERENCES

[1] A.M. Seifert & K. Messing, "Cleaning Up After Globalisation: An Ergonomic Analysis of the Work Activity of Hotel Cleaners" (2006) 38(3) *Antipode* 557-578

[2] A. Van Niekerk, "Is South African Law of Unfair Dismissal Unjust? A Reply to Martin Brassey" (2013) 34 *ILJ* 28 32-33

[3] B. Hudson, “Social Justice” in McLaughlin and Muncie (eds) *The Sage Dictionary of Criminology* (2013) 432-433

[4] C. Fenwick et al., "Labour Law: A Southern African Perspective" Discussion Paper *International Institute for Labour Studies* (Geneva 2007)

[5] C. Skinner, 2016 “The informal sector’s role in food security: A missing link in policy debates?” Working paper 44

https://doi.org/10.54934/ijlcw.v1i2.23

[6] D. Coyle, "The Weightless World: Strategies for Managing the Digital Economy" (Cambridge Mass MIT Press 1999)

[7] D. Du Toit, "What is the Future of Collective Bargaining (and Labour Law) in South Africa? (2007) 28 *ILJ* 1405-1435

[8] D. Du Toit et al., "Towards Legal Regulation of Platform Work: Theory and Practice" (2020) 41 *ILJ* 1493

[9] F. Hendrickx, "Foundations and Functions of Contemporary Labour Law" (2012) 3(2) *European Labour Law Journal* 108

[10] G. Rodgers et al., "The International Labour Organisation, and the quest for social justice, 1919-2009" (ILO-Cornell University Press, 2009)

[11] H. Bhorat, A. Lilenstein & B. Stanwix, "The Impact of the National Minimum Wage in South Africa: Early Quantitative Evidence" *DPRU* (University of Cape Town 2020)

[12] J.A. McLaurin & K. Liebman, "Unique Agricultural Safety & Health Issues of Migrant & Immigrant Children" (2012) 17(2) *Journal of Agromedicine* 186-196

[13] J. Friedman, "What's Wrong with Libertarianism?" (1997) 11(Summer) *Critical Review* 3

[14] J. Grogan, "Workplace Law" 11th ed (Juta Cape Town 2014)

[15] J. Marais in *Martin v Murray* (1995) 16 *ILJ* 589 © at 601C-F

[16] J. Theron, "Employment is Not What It Used to Be" (2003) 24 *ILJ* 1247-1282

[17] K. Van den Bos, "On the Subjective Quality of Social Justice: The Role of Affect as Information in the Psychology of Justice Judgments" (2003) *Journal of Personality and Social Psychology* 482-498

[18] L.G. Mpedi and N. Smit Access to Social Services for Non-Citizens and the Portability of Social Benefits within the Southern African Development Community (Sun Media Metro 2011) 3

[19] M. Brassey, "Fixing the Laws that Govern the Labour Market" (2012) 33 *ILJ* 1

[20] M. Ndulo, "Failed and Failing states: The challenges to African Reconstruction" (Cambridge Scholars, Newcastle, UK, 2013) 46-89

[21] M. Olivier & E. Kalula, "Regional Social Security" in M. Olivier, N. Smit & E. Kalula (eds) Social Security: A Legal Analysis (LexisNexis Butterworths 2003)

[22] M. Weiss, "Challenges for Labour Law and Industrial Relations" in Kim DO & Rönnmar M (eds) Global Labour and Employment Relations: Experiences & Challenges (Park Young Publishing & Company Seoul 2020)

[23] N. Mahlokoana, De Groot, H. Knox, & H. Bressers, "Determinants of energy use in the informal food sector, Department of Governance and Technology for Sustainability" (University of Twente, Netherlands 2019) 476-490

[24] O. Dupper, "Migrant Workers and the Right to Social Security: An International Perspective" 2007 *Stell LR*

[25] O. Kahn-Freund, "Labour, and the Law" (Stevens Publishing Oxford 1972) 8

https://doi.org/10.54934/ijlcw.v1i2.23

[26] P. Davies, & M. Freedland, “Kahn Freund's Labour, and the Law” (Stevens London 1983)

[27] R.J. Flanagan, "Labour Standards and International Competitive Advantage" in R.J. Flanagan R.J. and W. Gould (eds) International Labour Standards (Stanford University Press Stanford 2003) 17

[28] S. Rizvi, “Safety & Health of Migrant Workers: Understanding Global Issue and Designing a Framework Towards a Solution” (ILO Geneva 2015) 5

[29] W. Brown & S. Oxenbridge, "Trade Unions and Collective Bargaining" in Barnard S. Deakin S & Morris G. (eds) The Future of Labour Law Liber Amicorum Sir Bob Hepple QC (Hart Publishing 2004)

[30] Filipova, I. A. (2023). Creating the Metaverse: Consequences for Economy, Society, and Law. Journal of Digital Technologies and Law, 1 (1).

ABOUT THE AUTHOR

William Manga Mokofe – Ph.D. in Law, Faculty of Law & Commerce at Eduvos, in East London, South Africa. Advocate of the High Court of South Africa.
e-mail: william.mokofe@gmail.com
ORCID ID: https://orcid.org/0000-0002-5170-1304
Google Scholar ID: https://scholar.google.com/citations?hl=en&user=h_w4XXAAAAAJ

ABOUT THIS ARTICLE

Conflict of interests: Author declare no conflicting interests

https://doi.org/10.54934/ijlcw.v1i2.23

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Research article
Journal Link: https://ijlcw.emnuvens.com.br/revista
DOI: https://doi.org/10.54934/ijlcw.v1i2.22

SMART CONTRACTS: SECURITY ISSUES AND FURHTER DEVELOPMENT IN BRAZIL

Luane Silva Nascimento
Universidade Católica de Brasília-Distrito Federal, Brazil
David Gabriel Dutra Martins
Anápolis-Brazil

Article Information:

Received
September 8, 2022
Approved
October 12, 2022
Accepted
November 27, 2022
Published
December 29, 2022

Keywords:

business activity,
technologies,
security

ABSTRACT

This study aims to describe how smart contracts are made and the legal certainty of using them on business contracts. For this, the study concepted the smart contract, as well its characteristics and the difference between smart contract and e-contract. It described the legal certainty of smart contracts and how they can be used on business transactions. Besides, the research explained the importance of blockchain, ethereum and cryptocurrency in the smart contract. At last, it describes how smart contracts are applied in the legal universe and demonstrated their advantages as self-execution and clauses' immutability. For this work, bibliographic research and deductive method were used. The study concluded that the inexistence of law causes legal insecurity which represents an obstacle to spread the use of smart contracts.
.

FOR CITATION:

Nascimento, S. N. & Martins, D. G. D. (2022). Smart Contracts: Security Issues and Further Development in Brazil. International Journal of Law in Changing World, 1 (2), 26-45. DOI: https://doi.org/ 10.54934/ijlcw.v1i2.22

1. INTRODUCTION

This paper was organized based on the explanation of the smart contract concept and its distinctions with regard to other types of electronic contracts, such as the e-contract, since the so-called technological revolution has presented several tools to simplify, make feasible and democratize several activities of human life, which inevitably led to the inclusion of the contract, one of the oldest institutes of Law.

In the first chapter the concept of smart contracts was presented, which consists of contracts whose terms are reduced to programming languages that execute the commands that were contracted automatically.

Moreover, it was also shown that although the existence of a smart contract does not depend on its insertion in a blockchain, its use became much more attractive after the emergence of this technology. Along these lines, it was found that the blockchain is a decentralized data storage network, similar to a ledger, with the difference that there is no central authority able to change any of the data stored on the network.

The most widely used blockchain for smart contracts has been Ethereum, which was created in 2014 by Vitalik Buterin precisely with the goal of spreading the use of these resources, such as smart contracts, tokens, decentralized organizations, and other applications.

In the second chapter, the need for security in business transactions established through technology was demonstrated, thus, asymmetric cryptography has also been shown as a great ally, because it is essential to ensure security for users, however, the lack of regulation has been a major obstacle, as in the case of the Securities and Exchange Commission not considering a crypto-asset as a security due to the uncertainty of regulation leading to insecurity for the crypto economy.

In the third chapter, in turn, it was shown that, despite the obstacles that still exist for greater diffusion of the technology in the business environment, day after day the use of blockchain has been disseminated in various areas of law, especially in business activities, in notary and intellectual property records, however, the potential of this technology combined with smart contracts has been extremely broad, from cost sharing contracts to Decentralized Finance (DeFi).

https://doi.org/10.54934/ijlcw.v1i2.22

The research was conducted through bibliographic research, under the deductive method, whose problem was centred on the investigation of the legal (in)security present in smart contracts and how this can influence its diffusion in the business environment. From this, the objectives of conceptualizing smart contracts and explaining the applicability of programming and blockchain networks in the legal universe in business practice were stipulated.

Finally, it was found that the potential for use of the technologies presented is great, moreover, that the regulation of this new economy (crypto economy) can help popularize its use, since it will represent legal certainty to the user.

2. SMART CONTRACTS: GENERAL CONCEPTION

The beginning of this discussion permeates the contractual universe, therefore, for a better understanding of smart contracts, we will first make a brief note about contracts, since they are the essence of the discussion. According to experts [4, 11], a contract is a kind of legal transaction that results from an agreement of wills between two or more parties, precisely when these parties intend to create, modify or terminate rights in accordance with the legal order, creating in its content an individual legal rule capable of regulating the relationship created between the parties, furthermore, establishing rights and obligations, whose noncompliance is capable of generating sanctions and penalties, provided that it is a valid legal transaction.

Article 104 of the Brazilian Civil Code[1] provides for the assumptions of validity of a legal transaction, which are: to be performed by a capable agent, having as purpose a lawful, possible, determined or determinable object, in a form prescribed or not defended by law[2].

[1] BRAZIL. Law n° 10.406, January 10th, 2002. Establishes the Civil Code. Diário Oficial da União: section 1, Brasília, DF, year 139, n. 8, p. 1-74, January 11th, 2002. PL 634/1975. Retrieved from https://www.planalto.gov.br/ccivil_03/leis/2002/l10406compilada.htm

[2] Art. 104. The validity of a juristic act requires: I - a capable agent; II - a licit, possible, determined, or determinable object; III - a form prescribed or not defended by law. Retrieved from https://www.planalto.gov.br/ccivil_03/leis/2002/l10406compilada.htm

https://doi.org/10.54934/ijlcw.v1i2.22

Therefore, as the contract is a legal transaction, in order for it to be legally valid it is necessary to comply with the three essential requirements, which are subdivided into subjective, objective and formal [4] and which make up the Ponteana Ladder of existence, validity and effectiveness.

Although the Brazilian legislation contemplates contracts whose solemnity is a validity requirement, such as the real estate purchase and sale contract that requires the form of a public deed for goods whose value is higher than thirty minimum wages, there is no form required in the Brazilian legal system for the formation of smart contracts, there is not even specific legislation to regulate them, therefore, there is no obstacle regarding the validity of a smart contract, provided that the validity requirements exposed above are observed and it is possible to prove its authenticity and integrity, as well elucidated by Jimene [12] when discussing the admission of electronic documents as documentary evidence of legal acts and facts, according to the provisions of the Code of Civil Procedure, provided they have the peculiar characteristics of authorship and veracity.

Nick Szabo was a pioneer when writing about smart contracts, comparing them to a vending machine, due to its characteristic of formalizing and executing a certain contract autonomously from pre-determined commands, since the deposit of the amount required by the buyer would be enough for the machine to confirm the payment and deliver the chosen product without the need for the presence, in loco, of a person in the sales position.

Szabo further conceptualizes the smart contract as a set of promises and protocols in which the parties make promises and fulfill them [24, 25]. Currently these protocols are written in programming language and can be inserted in a blockchain[3], in which case they will be automatically executed as the parties confirm the fulfillment of their obligations.

It should be noted that the term "smart" is used because of the ability of the program, whose contractual terms were written, to execute the promises contained therein from the confirmation of the programmed commands and without the need for a relationship with a trusted third party between the

[3] A blockchain is a simple chronological database of transactions recorded by a network of computers. Each blockchain is encrypted and organized into a smaller data set called a "block". Each block contains information about a certain number of transactions, the reference of the previous block in the blockchain, and the answer to a mathematical puzzle, which is used to validate the information contained in each block. Each computer on the network contains a copy of the blockchain, and these computers synchronize the information periodically to ensure that they all contain the same information.

https://doi.org/10.54934/ijlcw.v1i2.22

parties, therefore, it is enough that both parties trust the code and the network used to write and insert the contract that will be signed between them, regardless of their location.

The discussion about the concept of smart contract has sharpened in recent years, and from it, Josh Stark pointed out two distinct definitions for smart contract, namely, Smart Contract Code and Smart Legal Contract [21]. The first term is used by professionals linked to programming and computer science to define the technology related to the code or program inserted in the blockchain capable of executing commands written in programming language, the second term is related to the legal conceptualization of the use of smart contract code for the formalization of a legally valid contract capable of being protected by law.

For Pinheiro "[...] smart contract can be understood as the set formed by the contract and the software used in its execution (Pinheiro, 2021). [...]". Authors such as Divino, on the other hand, restrict the concept of smart contract considerably [5]:

> [...] unilateral or bilateral legal business, almost inviolable, imperative, previously agreed upon in writing or verbally, reduced to the appropriate computer language (algorithms) and expressed in a digital term that will represent *ipsis litteris* the previously agreed upon, stored and executed in a decentralized database (*Blockchain*), to manage it autonomously and automatically from its formation to its termination - including conditions, terms, charges, and eventual clauses of civil liability - with the aid of software and hardware, without the interference of third parties, aiming at reducing transaction costs and eventual legal expenses, provided that legal and economic principles compatible with the contractual relationship established are applied.

However, this is a very restricted concept, since it is not necessary to aim for the reduction of transaction costs and eventual legal expenses in order to form the smart contract, although, in fact, the reduction of transaction costs and eventual legal expenses may be considered advantages of a smart contract compared to traditional contracts, however, they are not essential features for the formalization of the smart contract, moreover, furthermore, nothing prevents the smart contract code from being written for another network instead of a blockchain network, since the factor that makes a contract be considered smart is its ability to perform the terms adjusted without the need for human interference, therefore, it is the machine intelligence that differentiates a simple contract from a smart contract, thus, it becomes restrictive to conceptualize the smart contract together with the technology used contemporaneously with the text considering that technology is in constant evolution.

https://doi.org/10.54934/ijlcw.v1i2.22

Therefore, from a broader perspective, one can see that the smart contract is an unilateral, bilateral or more than two parts in a legal transaction, whose terms are reduced to a computer language expressed in a computer program capable of managing it autonomously and automatically.

Having made these initial conceptual considerations, it is important to elucidate the distinctions between smart contracts and e-contracts.

Electronic contracts or e-contracts are formed by electronic means of communication, especially the internet. Anderson Schreiber argues that the e-contract could not be considered another contractual genre, but only a means of electronic contracting (Schreiber, 2014), in this sense Bandeira corroborates by providing that "[...] smart contracts do not consist in a new type or contractual species; but in a technological means for contract formation [...]" [Author's translation] [1].

Thus, any contract formed by electronic means could be considered an e-contract, whether they are adhesion contracts, whose signature is the acceptance issued by the contracting party through the website or computer program, or the contracts inserted in platforms that enable the reliable collection of the electronic signature.

That said, it can be said that every smart contract is an e-contract, but not the opposite, because the smart contract has unique features that are not applicable to any electronic contract, which will be analyzed below.

The smart contract needs to be written in algorithms or other computer language of a certain software to dictate and execute the terms of the agreement, thus creating a computer program through the smart contract code, on the other hand, other electronic contracts do not need such technological complexity, it is enough that they are formed by electronic means.

In the wake of Divino an essential feature of the smart contract is that it is autonomous, that is, once its protocols are programmed, the contract performs its programming regardless of the will of the parties, however, it is not to be forgotten that not every e-contract has this feature, only the smart one [5].

Once the smart contract code is inserted in a blockchain it will not be possible to make any amendments considering the level of technological advancement today, that is, it is not possible to have an amendment term capable of modifying the terms written in a smart contract, however, in other

https://doi.org/10.54934/ijlcw.v1i2.22

electronic contracts this will be possible by simply inserting the amendment term in the same platform and collecting the signatures of the parties.

Thus, it can be said that the e-contract is a genus of which the smart contract is a species, and for a better understanding of the subject, it is necessary to situate the noble reader in relation to the blockchain, bitcoin and Ethereum.

In the line of Aaron Wright and Primavera de Filippi, blockchain is a platform that works as a distributed database with chronological records of transactions recorded by a network of computers, in which each blockchain is encrypted and organized into a set of smaller blocks that contain the information about a certain number of transactions accompanied by information from previous blocks and the answer of a mathematical puzzle, called hash, which is used to validate the data associated with each block [24].

Each computer has a copy of this blockchain that is synchronized with the other copies of the network periodically to ensure that everyone has the same database so that no one can defraud the network without requiring more effort than the potential reward for defrauding it.

So, for Aaron Wright and Primavera de Filippi:

> *A blockchain is simply a chronological database of transactions recorded by a network of computers. Each blockchain is encrypted and organized into smaller datasets referred to as "blocks". Every block contains information about a certain number of transactions, a reference to the preceding block in the blockchain, as well as an answer to a complex mathematical puzzle, which is used to validate the data associated with that block. A copy of the blockchain is stored on every computer in the network and these computers periodically synchronize to make sure that all of them have the same shared database*[1]

Thus, in the wake of the authors, one can state that a blockchain is equivalent to the ledger of a notary's office, since everything that is done in that program will be recorded, however, unlike the latter, there is no need for a server endowed with public faith to validate that information, because these are validated by anyone who uses the network, thus ensuring the authenticity of the information since it is confirmed by thousands of people who have no interest in it.

Mazzola and Lundgren teach "[...] it is literally a chain of blocks in which data of any nature is stored. It is as if the technology were a big digital ledger, where all kinds of transactions are registered

https://doi.org/10.54934/ijlcw.v1i2.22

[...]" [13] This technological innovation is of utmost importance to smart contracts, however, its utility is infinitely greater, for those authors "[...] the potential for use of this technology is practically infinite [...]".

After that, the concept of cryptocurrency will be exposed, which, according to experts [20] is a digital representative of values, whose issuance is not linked to a central authority of currency issuance, nor intertwined with a common fiat currency, but is accepted as a means of payment and can be stored in a digital wallet.

Bitcoin, in turn, is a cryptocurrency that was created by a person, or group of people, using the pseudonym Satoshi Nakamoto, programmed in open-source code in a peer-to-peer system, in which there is no central server or authority able to control its issue, which in turn is done through a process called mining. Mining is a process that involves the computational ability to solve a mathematical problem while processing the transactions made on the network.

The revolutionary potential of this technology provokes discussions in several areas of scientific knowledge, from programmers and economists to political scientists. With this in mind, Fernando Ulrich conceptualizes bitcoin for the legal universe as an intangible asset, as follows:

> [...] Bitcoins, as a monetary unit, are best considered an intangible good that, in certain markets, have been accepted in exchange for goods and services. We could say that these transactions constitute an exchange, and never a sale with payment in cash, as currency in each jurisdiction is defined by force of law, and is the exclusive prerogative of the state (Ulrich, 2014).

Ethereum, in turn, was created by Vitalik Buterin and consists of a blockchain platform that is equivalent to bitcoin, however, was not created with the intention of becoming digital currency, because its main function is the use of smart contracts. In this sense, authors Mazzola and Lundgren state that in addition to the implementation of smart contracts, the Ethereum network enabled "[...] the creation of voting systems, registration of property titles and, potentially, registration of any type of information and/or object, especially in the digital environment. The platform's currency is called ether and is used to reward the platform's miners, as well as being the platform's medium of exchange to enable the use of smart contracts. Undoubtedly, it is the largest smart contract platform today as it is able to perform the full turing, according to Gavin Wood (Wood, 2017).

https://doi.org/10.54934/ijlcw.v1i2.22

Conceição argues that within Ethereum it is possible to create smart contracts written in high-level computer language, which are converted to Ethereum bytecode, after which it will be inserted into the Ethereum blockchain to be executed [3].

That said, it is salutary for the popularization of smart contracts that the security of blockchain networks be duly proven, because it is undeniable the revolution that the use of this technology can bring to the legal universe, which will be demonstrated below.

3. SECURITY IN SMART CONTRACTS

It is known that technology is present in contemporaneity, so much so that any breakdown in the system and the lack of connection leads to financial losses and a real chaos in the business world, as it happened on October 04, 2021, when a problem in the WhatsApp, Instagram and Facebook systems caused an absence of communication in an interval of approximately 7 (seven) hours, costing Mark Zuckerberg more than 6 billion dollars and the position of 4th richest in the world to Bill Gates (Uol, 2021).

This insecurity leads, therefore, to conservatism and a certain resistance in the adoption of technologies for the execution of contracts. Nowadays, there is a very important security tool used in several technological sectors, namely cryptography, therefore, understanding cryptography is fundamental to study the security system of smart contracts.

Firstly, we must emphasize the difference between steganography and cryptography, since they are two different techniques, in which steganography seeks to hide a message without obscuring its content. Cryptography, on the other hand, differs from steganography and, according to Fiarresga, its true role is to hide the information so that, even if someone intercepts the message, they will not be able to understand it [9].

A curious fact is that Herodotus reported how Histieu transmitted a certain message to Aristagoras telling that Histieu shaved the head of an individual and wrote the message on his scalp, then waited for the individual's hair to grow back and sent him to meet Aristagoras, In this situation, this would represent steganography, you see, in this example, if the individual was intercepted and the interceptor shaved his

https://doi.org/10.54934/ijlcw.v1i2.22

head, he would have no difficulty in understanding the meaning of the message that Histieu sent to Aristagoras.

Otherwise, according to Fiarresga, cryptography uses several ciphers throughout time, varying according to their sophistication. It should be noted that only in the second half of the last century asymmetric ciphers started to be used, which means that from that moment on the key used to encrypt a message would no longer be the same as the one used to decrypt it, since two keys started to be used, one of them public and used to encrypt the message and the other private, which has the function of decrypting the message.

About asymmetric cryptography, Pereira and Nascimento "in this asymmetric model, the public key can be shared among all members who will make the communication; however, the private key is kept secret [...]" [Author's translate] (Pereira and Nascimento, 2021).

Sanas exposes that this type of cryptography with asymmetric cipher is used in blockchain networks such as bitcoin and ethereum granting a higher level of security for the user who has two keys, one public, which is used to identify his wallet on the network and another private, which has the function of authorizing access to his wallet (Sanas, 2021).

Another security tool that blockchain networks offer the user is consensus (mining), which consists in confirming the movements made on the network in a decentralized manner, through the solution of a mathematical equation. Now, imagine a person wants to transfer a certain amount of bitcoins to another, in which case the transaction will go through the validation process (consensus) before it is confirmed by the network, thus preventing fraudulent transactions, whether in an attempt to manipulate the network with duplicate transactions or hacker attacks in order to alter information recorded in the blockchain.

Having exposed the main technical security tool, not only of smart contracts and the so-called crypto-economy, a brief study will be made on the legal security related to smart contracts. A priori, it is necessary to consider that there are no legal impediments for the use of smart contracts, since for the existence of a legal business it is enough that the requirements of article 104 of the Civil Code of 2002 are observed, moreover, there is no legal form prescribed by law for the formation of these contracts, therefore, it is perfectly possible that an agreement is formalized by means of a smart contract, in this line, "implications were found as to the validity and effectiveness of legal business instrumented in smart

https://doi.org/10.54934/ijlcw.v1i2.22

contracts, especially with the claim that the principle of the social function of the contract is an obstacle to the validity […]" (Sanas, 2021).

One should not forget that the social function of contracts is provided for in article 421 of the Brazilian Civil Code and, therefore, it must also be observed in smart contracts, since it is a general clause of contract law.

Thus, although Efing and Santos have concluded that the principle of the social function of contracts would prevent the implementation of smart contracts in Brazil, the authors did not consider all the possible functions of this technology, because even if the insertion of the smart contract in the blockchain makes it immutable, nothing prevents that, provided that prior to the insertion in the blockchain, mechanisms to control the execution of the contract are programmed, or even that a reverse operation can be performed to correct any error in execution [6].

To make this situation possible, it was suggested "the figure of the 'Judge as a Service', a kind of arbitrator with technical powers to reverse or change transactions performed through smart contracts on the Blockchain [...]".

But it is worth noting that throughout the research were not found authors who support the idea of changing transactions, however, this does not make less impactful the figure of the judge as a service, in this sense, Sanas explains that the use of smart contracts for alternative dispute resolution is easy to develop and can increase efficiency and reduce transaction costs.

Judge as a Service is very similar to the figure of the arbitrator, already consolidated in Brazilian law through Law 9.307/96[4], which allows the parties to elect the arbitration court to resolve conflicts, in accordance with the provision of Article 2 of that law, *in verbis*:

> Art. 2 The arbitration may be of law or of equity, at the discretion of the parties.
> § 1st The parties are free to choose the rules of law that will be applied in the arbitration, provided they do not violate good customs and public order.
> § 2nd The parties may also agree that arbitration be based on general principles of law, usages and customs, and international rules of trade.
> § 3rd The arbitration involving the public administration will always be in law and will respect the principle of publicity.

[4] BRAZIL. Law 9.307 de 1996. Brasília, DF: Presidency of the Republic. Available at: http://www.planalto.gov.br/ccivil_03/leis/l9307.htm. Access in: october, 26th, 2021.

https://doi.org/10.54934/ijlcw.v1i2.22

In addition, the Civil Code after the changes introduced by Law 13,874/2019[5] safeguards the compliance with the principle of minimum intervention and the exceptionality of contractual revision in private relations, thus strengthening the principle of *pacta sunt servanda*.

In this sense, even before the Economic Freedom Law (13.874/2019)[6] came into effect, the Brazilian courts have already decided for the application of the principle of the autonomy of the will and the mandatory force of the agreements (pacta sunt servanda) to business contracts, as per the content of REsp 936. 741/GO under the Rapporteur of Minister ANTONIO CARLOS FERREIRA, in the FOURTH GROUP, whose judgment was held on 03/11/2011 and published in the DJe 08/03/2012, as well as in special appeals 1910582, 1644890, 1799627, 1691008, 1441620, 1409849 and 1413818 all judged by the Superior Court of Justice.

Therefore, the apparent conflict between the immutability feature of smart contracts and the principle of the social function of the contract and even the *rebus sic standibus* clause does not prove to be a major obstacle for its use.

Nevertheless, considering the applicability of smart contracts in foreign trade transactions, the immutability of smart contracts is not an obstacle in the eyes of international law, since, according to Pinheiro (2021), the autonomy of the will is a principle of Private International Law common to most national systems.

[5] BRAZIL. Law 13.874 from 2019, **Establishes the Bill of Rights for Economic Freedom.** Brasília, DF: Presidency of the Republic. Article 421, § sole. Available at: http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/lei/L13874.htm. Access in: october, 26th, 2021.

[6] BRAZIL. Law 13.874 from 2019, **Establishes the Bill of Rights for Economic Freedom.** Brasília, DF: Presidency of the Republic. Available at: http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/lei/L13874.htm. Access in: october, 26th, 2021.

https://doi.org/10.54934/ijlcw.v1i2.22

4. APPLICABILITY OF BLOCKCHAIN PROGRAMMING AND NETWORKS IN THE BUSINESS ACTIVITY

The blockchain technology and smart contracts have been generating impact on the world economy due to its popular use with cryptocurrencies, however, there are countless other activities common to the legal universe that can be impacted by the use of this technology.

This is what is inferred from the intelligence of Sanas apud Santa Cruz "the more crypto active products consolidate, the smarter contracts will also consolidate, I think they are very closely linked [...]"(Cruz, 2021).

Thus, it is possible to state that smart contracts have great potential to overcome the problem of distrust between the parties, due to their attributes of self-execution and immutability, which represents a very important differential in the business environment, especially.

Moreover, as demonstrated elsewhere, the blockchain can be compared to a ledger, due to its feature of immutability of the information entered and authenticated, thus, in view of this immutability and granting of legal security to formalized acts, the use of blockchain has also significantly impacted the notarial activities in Brazil, so much so that the National Council of Justice (CNJ) through Provision No. 100, of May 26, 2020, regulated the practice of electronic notarial acts using the e-Notary system, which is able to perform notarial acts digitally.

Also, in 2020 the Notarchain project emerged, which aims to allow the validation and authentication by the notaries of documents in digital form through Provision No. 100/2020[7], with this, the Brazilian College of Notaries intends to make each notary's office a validation node of the e-Notary network and, for this, has been using the Hyperledger Fabric blockchain.

It also highlights the practicality that blockchain technology grants to the procedure of registering works for the protection of intellectual property, for Mazzola and Ludgren "[...] The registration of creations in blockchain allows, therefore, robust proof of authorship and the exact moment of creation of original works (Mazzola, 2021)".

[7] BRAZIL.CNJ. **Provision n° 100, may, 26th, 2020**. Provides for the practice of electronic notarial acts using the e-Notary system, creates the Electronic Notary Registration-MNE and makes other provisions. Available aat: https://atos.cnj.jus.br/atos/detalhar/3334. Access in: october, 18th, 2021.

https://doi.org/10.54934/ijlcw.v1i2.22

The use of this technology cumulated with smart contracts would make possible automatic applications for licensing the use of works by third parties, with automatic remuneration for the artist, outside the intellectual property branch, it would also be possible to write off in fiduciary alienation, For example, as from the confirmation of the payment by the smart contract, the smart contract would automatically, without the need for human intervention, proceed with the write-off procedure at the real estate registry, which would undoubtedly represent the celerity of the procedures and debureaucratization of the system.

Moreover, it is also worth mentioning that the Internet of Things is in vogue, which in the words of Santos "is nothing more than an extension of the current Internet, which allows everyday objects (whatever they may be), but with computing and communication capabilities, to connect to the Internet." (Santos et al, 2016).

In this way, combined with the IoT (Internet of Things) it is possible, for example, for a smart contract to be able to shut down or reduce the operation of vehicles from the moment the purchase and fiduciary alienation of the vehicle are programmed into the smart contract, therefore, the lack of payment of the installments will trigger the command provided in the contract code and automatically may, even before the creditor takes legal action, turn off the functions of the vehicle, subject to the technological conditions of the vehicle, obviously, which will reduce the cases of concealment of assets to avoid liability.

The significant economy of time and resources that would be spent by the creditor when he or she calls the Judiciary to declare the search and seizure of the vehicle will be remarkable, thus reducing the risk of it being stolen and transported to an uncertain place. Even if it is, current technology makes it almost common to locate vehicles in real time.

Another possibility of use of smart contracts applied in blockchain networks are the Decentralized Autonomous Organizations (DAO), which work from the interconnection of several smart contracts and according to Porto, Junior and Silva these have the function of codifying the rules of operation and the structure of an organization (Porto et al., 2019).

The use of smart contracts can be of great value to the so-called cost sharing contracts, which according to Estrada and Bez-Batti are contracts that aim to apportion the costs of research, development

https://doi.org/10.54934/ijlcw.v1i2.22

and services, since smart contracts have the ability to debit pre-determined accounts with previously defined values, thus facilitating the apportionment of expenses [7].

Furthermore, much has been discussed about Decentralized Finance (DeFi), which consists of decentralized finance protocols controlled by governance tokens that entitle their holders to vote on these finance protocols. This type of use allows overly bureaucratic and time-consuming practices to be carried out with extreme efficiency and time savings, however, like everything involving smart contracts, its use is still in the experimental phase.

Tokens, in turn, are digital certificates that represent some item, fungible or non-fungible (NFT) and that are commonly transacted on a blockchain, in the meantime, according to Mazzola and Lundgren "[...] on the blockchain network, virtually any item of any nature, whether physical or digital, can be represented by means of a token".

Tokens are very useful for smart contracts and represent in bits and bytes existing physical assets. Recently tokens representing a farm in Arapuanã[8] were issued to finance a mining project on its land. At the time, each token issued represented a portion of the land on this farm.

This "tokenization" economy has been growing a lot and, as a result, has drawn attention to a discussion about the need for registration of the public offering with the Securities and Exchange Commission (CVM), which, in turn, through the Administrative Sanctioning Procedure 19957.003406/2019-91 considered that a certain company offered tokens in an irregular manner.

In this procedure, it was discussed whether the crypto asset offered should be considered a security in Brazilian law or not and, considering that the asset was publicly offered, purchased by people in a collective venture in expectation of profits, it was concluded that it was in fact a security, resulting in a fine to the issuer for offering securities irregularly.

Given these situations, there is still uncertainty regarding the development and spread of the use of smart contracts and blockchain, which can be justified due to the lack of regulation, a fact that causes uncertainty for people. However, the national regulatory bodies have been moving in this direction. The

[8] Cointelegraph. (2020). “Fazenda de Ouro no Amazonas será tokenizada no Ethereum e se tornará uma das primeiras cryptoproperty do Brasil”. Available at https://cointelegraph.com.br/news/farm-in-amazonas-becomes-cryptau-the-first-fully-tokenized-property-in-brazil

https://doi.org/10.54934/ijlcw.v1i2.22

Brazilian Federal Revenue Service, for example, through Ordinance No. 1,074[9], published in June 2019, dispensed with formalities for the provision of information to the Individual Taxpayer Registry (CPF) and the Corporate Taxpayer Registry (CNPJ) if shared through blockchain. This is what can be inferred from the content of Article 1 of the aforementioned Ordinance, in verbis:

> Art. 1 The formalization of adjustments in existing agreements for the supply of information from the Individual Taxpayer Registry (CPF) and the Corporate Taxpayer Registry (CNPJ) to agencies, autarchies and public foundations of the Union, the States, the Federal District and the Municipalities, in the event of adoption of data sharing through:
> I - blockchain permissioned network;
> II - web services or application programming interface (API).

Furthermore, Normative Instruction 1.888/2019[10], also issued by the RFB, presented a legal definition of crypto active, *in verbis*:

> Art. 5 For the purposes of the provisions of this Normative Instruction, the following are considered
> I - crypto-asset: the digital representation of value denominated in its own unit of account, whose price can be expressed in local or foreign sovereign currency, transacted electronically with the use of cryptography and distributed record technologies, which can be used as a form of investment, instrument for transfer of values or access to services, and which does not constitute legal tender;

Certainly, the subject under discussion still lacks legal regulation for the use of these technologies to be better used by society. However, in the wake of Sanas the interdisciplinary approach bringing together lawyers, developers and economists could contribute to the agility of this process and the issue of rules and regulations capable of enabling the development of these applications.

[9] BRAZIL. Federal Revenue of Brazil. Ordinance RFB n° 1074, June 18th, 2019. Waives the formalization of adjustments to agreements in effect for the supply of registration information to organs and entities of the public administration, in the cases mentioned. Available at: http://normas.receita.fazenda.gov.br/sijut2consulta/link.action?visao=anotado&idAto=101770. Accessed in: October 26th, 2021.

[10] BRAZIL. Federal Revenue of Brazil. Normative Instruction RFB n° 1888, May 3rd, 2019. Establishes and regulates the obligation to provide information regarding the operations performed with crypto active products to the Special Secretary of the Federal Revenue of Brazil (RFB). Available at: http://normas.receita.fazenda.gov.br/sijut2consulta/link.action?visao=anotado&idAto=100592. Accessed in: October 26th, 2021.

https://doi.org/10.54934/ijlcw.v1i2.22

It is obvious that, nowadays, a revolution in contracting instruments in general cannot be delayed, since their widespread use, whether as a complete replacement for simple instruments such as instantaneous purchase and sale agreements or as tools to facilitate the formation of more complex instruments, would represent an important advance in the globalized and negotiating world.

Nevertheless, this storyline has also shown that although smart contracts are revolutionary they are not capable of replacing more complex instruments loaded with subjectivity, as may happen in corporate transactions such as mergers and acquisitions, which are integrated of several documents, such as *memorandum*s and letters of intent, however, in contracts for the acquisition of products, goods, raw materials and other instruments or goods for the operation of the company's activities, the smart contract may certainly speed up the process, besides being less expensive because it would put the businessmen in contact independently of the collaborators.

It is undeniable that the tools studied here will remain permanently in the legal universe and, it is essential that lawyers, servers and judges use ICTs in their favor, since these exist to help these professionals in their work, in this sense, even if blockchain technology and smart contracts are removed from the category of Information and Communication Technology for technical or conceptual reasons, professionals should look at them with the same care.

.

5. CONCLUSIONS

Despite the doctrinal divergence about the degree of innovation that smart contracts along with blockchain technology can provide in the contractual practice, it is common ground that these technologies have conquered a definitive space in humanity and, consequently, in legal practice, so much so that the theme has been growing along with the use of these tools in Brazil.

Proof of this is the emergence of the Notarchain in the Brazilian notarial system, thus indicating that the notaries were the first to advance in this direction, even if with a certain timidity.

The tokenization of assets has also shown itself to be quite advanced, but, despite the level of technological security being quite satisfactory to users, the lack of regulation is still an obstacle to the propagation of the crypto economy, as well as to its reaching various layers of the Brazilian population.

https://doi.org/10.54934/ijlcw.v1i2.22

Furthermore, the research found that the use of smart contracts in business activity is too attractive, due to its almost infinite potential combined with blockchain and IoT, however, further development of the crypto economy will be necessary to understand the limits of smart contracts.

It is not to be forgotten that traditional contracts are likely to be radically replaced by smart contracts, given their ineffectiveness in the formation of documents of complex matters, namely, corporate transactions and contracts with great subjectivity.

Therefore, we conclude that the development of the crypto-economy and the effective regulation of crypto-activities are essential to ensure legal certainty and financial security and, consequently, enable the widespread use of this technology in business activities.

.

REFERENCES

[1]Bandeira, Paula Greco (2021) Os *Smart Contracts* no Direito Contratual Contemporâneo. Discussões sobre Direito na Era Digital, cord. Ana C. Pinho. 1ª ed. Rio de Janeiro: GZ, 2021, p. 557-576.

[2]Brandão, Pedro Ramos (2020) Criptomoeda: o *Bitcoin*. Retrieved from https://repositorioaberto.uab.pt/handle/10400.2/10377

[3]Conceição, Tomás Morgado de Carvalho (2019) *Validation of Smart Contracts Through Automated Tooling.* Retrieved from https://estudogeral.sib.uc.pt/bitstream/10316/86360/1/Validation_of_Smart_Contracts_through_Automated_Tooling.pdf

[4]Diniz, Maria Helena Diniz (2020) Curso de Direito Civil Brasileiro. São Paulo-SP. Saraiva Jur.

[5]Divino, Sthéfano Bruno Santos (2018) *Smart Contracts*: Conceitos, Limitações, Aplicabilidade e Desafios, 2018. Retrieved from https://www.cidp.pt/revistas/rjlb/2018/6/2018_06_2771_2808.pdf

[6]Efing, A. C., Santos, A. P. (2018) Análise Dos Smart Contracts À Luz Do Princípio Da Função Social Dos Contratos No Direito Brasileiro. Revista Do Programa De Pós-Graduação Em Direito (Mestrado Em Direito E Desenvolvimento Sustentável) Direito E Desenvolvimento, Issn 2236-0859, João Pessoa, V. 9, N. 2, P. 49-64, Aug./Dec. 2018.

[7]Estrada, R. D; Bez-Batti, G. (2021) Contratos De Cost Sharing E Os Serviços De Computação Em Nuvem. Discussões Sobre Direito Na Era Digital, Cord. Ana C. Pinho. 1ª Ed. Rio De Janeiro: Gz, 2021, P.687 – 701.

[8]Ferraz, Márcia H. M. "O Trabalho Prático No Laboratório De Química Na Universidade De Coimbra: Séculos Xviii E Xix." In *O Laboratório, A Oficina E O Ateliê: A Arte De Fazer O Artificial*, Org. Ana M. Alfonso- Goldfarb, & Maria H. R. Beltran, 115-40. São Paulo: Educ; Fapesp; Comped; Inep, 2002.

https://doi.org/10.54934/ijlcw.v1i2.22

[9]Fiarresga, Victor Manuel Calhabrês. (2010) Criptografia e Matemática. Dissertação (Mestrado em Matemática para Professores) – Faculdade de Ciências, Universidade de Lisboa, Belas,

[10] Gonçalves, Camargos (2017) *Blockchain, Smart Contracts* e '*Judge As a Service'* no Direito Brasileiro. Anais do II Seminário Governança das Redes e o Marco Civil da Internet, org. Fabrício B. P. Polido, Lucas C. dos Anjos & Luíza C. C. Brandão, Belo Horizonte: Instituto de Referência em Internet e Sociedade, 2017, p. 207-211.

[11] Gromova, E. (2018) Smart contracts in Russia: an attempt to define the legal nature of smart contracts, Journal of Law and Digital Economy, 2, 31-33.

[12] Jimene, Camilla do Vale (2010) O valor probatório do documento eletrônico, São Paulo: Sicurezza, 2010.

[13] Mazzola, Lundgren (2021) *Blockchain* e Propriedade Intelectual: Impactos Práticos da Tecnologia. Discussões sobre Direito na Era Digital, cord. Ana C. Pinho. 1ª ed. Rio de Janeiro: GZ, 2021, p. 529 – 546.

[14] Nakamoto, Satoshi (2008) Bitcoin: A Peer-to-Peer Eletronic Cash System. Retrieved from https://bitcoin.org/bitcoin.pdf

[15] Pereita, Pedro Paulo Prudente e Nascimento, Luane Silva (2021) Inovações, Instrumentos e Ferramentas Tecnológicas no Direito. Discussões sobre Direito na Era Digital, cord. Ana C. Pinho. 1ª ed. Rio de Janeiro: GZ, 2021, p. 593-616.

[16] Pereira, Pedro Paulo Prudente e Nascimento, Luane Silva (2021) As Tecnologias da Informação e Comunicação (tic's), o Direito Digital e a Transformação Digital em Razão da COVID-19. Discussões sobre Direito na Era Digital, cord. Ana C. Pinho. 1ª ed. Rio de Janeiro: GZ, 2021, p. 617 – 636.

[17] Pinheiro, Luís de Lima (2021) *Smart Contracts* e Direito Aplicável. Discussões sobre Direito na Era Digital, cord. Ana C. Pinho. 1ª ed. Rio de Janeiro: GZ, 2021, p. 503 – 527.

[18] Porto, Junior e Silva. (2019) Tecnologia *Blockchain* e o Direito Societário. Tecnologia *Blockchain* e Direito Societário: Aplicações Práticas e Desafios para a Regulação 2019, p. 11-30.

[19] Sanas, Caio Fernando (2021) O Futuro dos Contratos: Pontencialidade e Desafios dos *Smart Contracts* no Brasil. Volta Redonda-RJ, Editora Jurismestre.

[20] Santos et. al. (2016) Internet das Coisas: da Teoria à Pratica. Retrieved from https://homepages.dcc.ufmg.br/~mmvieira/cc/papers/internet-das-coisas.pdf

Schreiber, Anderson (2014) Contratos Eletrônicos e Consumo, REVISTA BRASILEIRA DE DIREITO CIVIL. ISSN 2358-6974. Volume 1, p. 88-110, Jul./Set. 2014.

[21] Stark, Josh (2016) *Making Sense of Blockchain Smart Contracts*. Coindesk, 2016. Disponível em < https://www.coindesk.com/making-sense-smart-contracts/>.

[22] Szabo, Nick. (1997) *Formalizing and Securing Relationships on Public Networks*, 1997. *First Monday*, Disponível em <https://firstmonday.org/ojs/index.php/fm/article/view/548/469>.

[23] Szabo, Nick (1996) *Smart Contracts: Building Blocks for Digital Markets*, 1996. Disponível em <https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html/>

https://doi.org/10.54934/ijlcw.v1i2.22

[24] Wright, A.; De Filippi, P. (2015) Decentralized Blockchain Technology and the Rise of Lex Cryptographia. Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2580664

ABOUT THE AUTHOR

Luane Silva Nascimento – Law Professor at Universidade Católica de Brasília-Distrito Federal, Brazil
e-mail: luanesnascimentolsn@gmail.com
Google Scholar ID: https://scholar.google.com/citations?hl=en&user=F_FD62AAAAAJ

David Gabriel Dutra Martins – Specialist in Cryptocurrency Law. Auditor of the Court of Sports Justice of the Anapolina Sports League – TJDLAD. Lawyer specializing in contracts, business law and tax law, with experience also in civil, banking and consumer law. Cryptocurrency law researcher, with works published in the "Collection of Digital Law Manuals" and in the book "Law and Digital Technologies – The way forward", both scheduled to be released by the first half of 2023.
e-mail: davidmartins.2104@gmail.com

ABOUT THIS ARTICLE

Conflict of interests: Author declare no conflicting interests

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Research article
Journal Link: https://ijlcw.emnuvens.com.br/revista
DOI: https://doi.org/10.54934/ijlcw.v1i2.29

PATIENTS' PERSONAL DATA, INCLUDING BIOMETRICS, AS OBJECTS OF CRIMINAL LAW PROTECTION

Albina Shutova
Department of Criminal Law and Procedure,
Kazan Innovative University named after V.G. Timiryasov, Kazan, Russian Federation

Article Information:

Received
October 17, 2022
Approved
October 18, 2022
Accepted
October 29, 2022
Published
December 29, 2022

Keywords:

personal data,
crimes, biometric
personal data,
criminal law,
medical secrecy

ABSTRACT

Objective. The article is devoted to the issues of criminal law regulation of personal data of patients constituting a medical secret. The purpose of the study is to assess the level of legal regulation of social relations against which criminal encroachments are committed in the processing of personal data, as well as the improvement of Russian criminal legislation in this area. **Methods.** A literature review was conducted of studies published in the Dimensions and Elibrary databases. We have selected 16 papers published in full text, online and free of charge in 2010-2020. **Findings.** The institution of personal data, including biometric data, is wider than the institution of medical secrecy and includes a wider range of information about the patient. The institution of personal data is universal, as it is aimed at regulating public relations in various spheres of public life, and the institution of medical secrecy is only in the healthcare system.

FOR CITATION:

Shutova, A. (2022). Patients' Personal Data, Including Biometrics, as Objects of Criminal Law Protection. International Journal of Law in Changing World, 1 (2), 46-59. DOI: https://doi.org/10.54934/ijlcw.v1i2.29

1. INTRODUCTION

Contemporary life necessitates rendering high-quality medical services to the population, which inevitably leads to improvement and increased attention to high-technology medical aid. Undoubtedly, the observed scientific and technical progress actualized the need to integrate medical technologies into the legal framework. The Concept of developing regulation of relations in the sphere of artificial intelligence technologies and robotics up to 2024, adopted by the Decree of the Russian Government of 19 August 2020 no. 2129-r, pays significant attention to such area of improvement as *regulation of applying the artificial intelligence technologies and robotics to the sphere of healthcare*.

Taking into account the prospects of further active introduction of robotized medicine, we would like to highlight the area which is, in our opinion, not yet sufficiently regulated and needs further improvement. When rendering medical aid, including surgical, medical robots interact with humans and may collect and store a large amount of information about the patients (about their health, fact of application, diagnosis, information about treatment, etc.) and their biometric data. In this regard, the issues of informational security of the patients' personal data and the state of criminal-legal regulation of public relations in this sphere are topical. This issue is also relevant in the aspect of transition of medical institutions to electronic document flow, which also contains a large amount of patients' data. In general, the global community pays great attention to both personal data protection and legislative changes in respect of confidentiality (Lopes, Guarda, Oliveira, 2020).

2. PATIENT PERSONAL DATA AND CRIMINAL LAW

2.1 Personal data: concept

With the development of digital technologies and improvement of medical services, the volume of patients' biometric data will increase. Most of the information previously kept on paper is now digitally transmitted, which creates new digital challenges and threats in relation to security and confidence, particularly, in relation to protecting personal data in the society which becomes more and more digital (Mitchell, Kan, 2019).

https://doi.org/ 10.54934/ijlcw.v1i2.29

We should agree with A. A. Mokhov, who believes that biobanks are created in Russia, thus the risks increase of illegal acquisition of information which characterizes the biological essence of the relevant persons (Mokhov, 2021).

Assumingly, the patient's data acquired by wrongdoers via illegal access may threaten citizens' confidentiality. Actions of a surgeon, tactile feedback, and video recordings of a medical robot may contain personal information, including naked parts of the body of a patient. This opinion is shared by E. E. Istratova and A. A. Molchanov, who emphasize that the most critical aspects of medical robots are the aspects of safety (in a broader sense – both physical and informational) and (Istratova, Molchanov, 2015). We should agree with foreign authors in that medical confidentiality is a subject for disputes, as it is necessary to protect a patient's privacy and, at the same time, bear responsibility for preserving other people's health (Raimundo, Grando, Machado, Oliveira, Cabar, 2022). The regime of personal data protection is of particular concern due to their vulnerability, probable illegal actions, discrimination, and unethical illegal use (Alrefaei, A.F., Hawsawi, Y.M., Almaleki, D. et al., 2022). At the same time, the polls on personalized medicine held in Pennsylvania (USA) and Bavaria (Germany) showed that most of the respondents were concerned about misuse of genetic data (Kichko, K., Marschall, P.&Flessa, S., 2016).

While processing personal medical information about patients, the following types of illegal actions can be committed: improper collection of personal medical information by other people without legal grounds for its collection; improper distribution of personal medical information; improper use and improper storage of personal medical information.

Federal Law of July 27, 2006 No. 152-FZ "On personal data"[1] (further – the Law "On personal data") contains no reference rule on imposing criminal liability for divulgence of personal data. However, one should bear in mind that the problem of protecting biometric personal data is raised in many juridical sciences. At the same time, the issue is complicated by the fact that currently there is no common conceptual and categorical framework or legal regime, which causes problems in law enforcement, including those related to distinguishing between administrative law breaches and crimes.

From the viewpoint of conceptual and categorical framework, criminal legislation uses the notion "information about the private life of a person constituting their personal or family secret" (Article 137 of

[1] Federal Law of July 27, 2006 No. 152-FZ "On personal data". Collection of legislation of the Russian Federation. 2006. No. 31 (part I). Article 3451.

https://doi.org/ 10.54934/ijlcw.v1i2.29

the Russian Criminal Code) and "personal data" (part 2 of Article 173^2 of the Russian Criminal Code), administrative law – "restricted-access information", labor law – "personal data", civil law – "non-material values", medicine – "medical confidentiality". However, in our opinion, this may lead to problems in qualification of illegal actions, when it may be hard to distinguish between "restricted-access information" and "information about the private life of a person". We believe that in all branches of the Russian law there must be a common regime of personal data protection. Therefore, the above categories must be demarcated. Conversely, foreign authors strived to distinguish between information about the private life of a patient and other confidential information by specifying the main criterion for their distinction – they refer to different types of protection, which correspond to different types and methods of civil rights and interests' protection and have different accentuations (NanLiu, ShiyongChen, 2022).

According to Article 13 of Federal Law of November 21, 2011 No. 323-FZ "On the principles of health protection of the citizens in the Russian Federation", ***medical confidentiality*** is interpreted as *"information about the fact of a citizen applying for medical aid, condition of their health and diagnosis, other data obtained during their medical examination and treatment"*.

The legislative definition of "personal data" is contained in the Law "On personal data", which stipulates that "personal data are any information referring directly or indirectly to a particular or defined physical person (the subject of personal data)". It is worth noting that the definition of "personal data" is too abstract and allows referring *any data* to such (in the opinion of the subject). Besides, the law does not stipulate any specific list of data referred to personal data. Some definite interpretation may arise when examining Article 8 of the Law "On personal data", which stipulates that "the publicly available sources of personal data, with the written consent of the subject of personal data, may include their surname, first name, year and place of birth, address, telephone number, information on profession and other personal data, reported by the subject of personal data". However, of interest is the double blanket character, used in the above definition in relation to the notion of "other personal data".

In turn, medical confidentiality is closely connected with personal data, which, in our opinion, are its indispensable reflection. In judicial practice there are cases when criminal liability was imposed for disclosure of information about a patient's state of health, constituting medical confidentiality. *According to the Prosecutor's Office of Chelyabinsk oblast, a 46 year-old resident of Desyatiletiye village is charged with a crime stipulated by part 1 Article 137 of the Russian Criminal Code. In 2015, the woman, working*

https://doi.org/ 10.54934/ijlcw.v1i2.29

as a hospital attendant, in conversations with the village residents disclosed information about the state of health of a patient, which became known to her in relation with her employment duties[2].

According to the tenor of Article 3 of the Law "On personal data", the information constituting personal and family secret can be referred to the personal data. At that, personal and family secret constitute a large part of the volume of the notion of personal data. The Constitutional Court of the Russian Federation formulated in its Resolution of June 28, 2012 No. 1253-O: "... only the person themselves is entitled to determine which data referring to their private life must remain secret, therefore, collection, storage, use and dissemination of such information, not entrusted to anyone, is not allowed without consent of the said person, as is stipulated by the Constitution of the Russian Federation"[3].

Stemming from the carried out examination of judicial practice, one may conclude that personal data are characterized by the following features:

– *information about a person;*

– *the person determine by themselves, which data refer to their private life and, therefore, are a secret;*

– *the said data are not subject to control on the part of the state and the society;*

– *they are not of illegal character.*

Based on the above, one may assert that personal data shall constitute a personal and/or family secret in case the subject themselves refers them to such. That said, *a personal and family secret complies with all features of personal data* (though of a special nature). However, it is interesting to note that the said circumstance was not taken into account in the Decree of the Plenum of the Supreme Court of the Russian Federation of December 25, 2018 No. 46 "On some issues of judicial practice in cases on crimes against constitutional human and civil rights and freedoms (Articles 137, 138, 138[1], 139, 144[1], 145, 145[1] of the Russian Criminal Code)"[4].

[2] https://epp.genproc.gov.ru/ru/web/proc_74/mass-media/interviews-and-presentations

[3]Resolution of the Constitutional Court of the Russian Federation of June 28, 2012 No. 1254-O "On refusal to hear an appeal of Ukraine citizens Svetlana Vladimirovna Bondarkova, Aleksey Vasilyevich Zolin and Vasily Sergeyevich Zolin of violation of their constitutional rights by clause 'a' of Article 5, Article 6 and part 1 of Article 12 of Federal Law "On the citizenship of the Russian Federation". "KonsultantPlyus" Reference system.

[4] Decree of the Plenum of the Supreme Court of the Russian Federation of December 25, 2018 No. 46 "On some issues of judicial practice in cases on crimes against constitutional human and civil rights and freedoms (Articles 137, 138, 1381, 139, 1441, 145, 1451 of the Russian Criminal Code)". Rossiyskaya gazeta, January 9, 2019.

https://doi.org/ 10.54934/ijlcw.v1i2.29

2.2 Criminal law protection of personal data

The institute of personal data, medical confidentiality and information about the private life of a person constituting their personal or family secret is protected by criminal and administrative legislation of Russia.

In its explanation, the Supreme Court of the Russian Federation did not determine the list of data referred to personal or family secret or draw its difference from other categories, including personal data; hence, there are no criteria for distinguishing between criminal and administrative liability.

The institute of personal data is protected by administrative legislation, in particular Articles 13.11 and 13.14 of the Russian Administrative and Procedural Code. The objects of these administrative law breaches are public relations in the sphere of communication and information, which stems from the structure of the normative-legal act. Administrative liability must be imposed for the deeds which are less publicly hazardous than crimes. However, the character of public hazard of such deeds must cause no doubt, especially under the accelerating informatization of the society, emergence of new technologies, devices and techniques of obtaining, transmitting and storing of information.

In our opinion, a more consequential and substantiated approach is criminalization of the deeds related to the essential violation of the current legislation on personal data protection.

According to T. V. Deryugina, criminal legislation has a significant gap in the sphere of non-material values protection, being limited to two norms: Articles 137 and 128^1 of the Russian Criminal Code (Mokhov, 2021).

The objective part of corpus delicti stipulated by Artcile 137 of the Russian Criminal Code is liability for illegal collection or distribution of information about the private life of a person constituting their personal or family secret. It stipulates prohibition of *illegal collection of information*, but the list of means is not determined in the structure of Article 137 of the Russian Criminal Code; thus, it can be stated that the means of information collection may be both *unprohibited by law* (personal surveillance, questioning of persons), and *illegal* (theft, illegal trespassing, wiretapping, unsanctioned copying, etc.). Thus, liability depends on the means of collecting such data, as illegal means of collecting information may constitute a separate corpus delicti.

https://doi.org/ 10.54934/ijlcw.v1i2.29

At the same time, of interest is the legislative approach to constructing a criminal-legal norm stipulated in Article 183 of the Russian Criminal Code, which determines the means of collecting information constituting a commercial, banking, or taxation secret: theft of documents, bribery, threats, other illegal means. We believe that the indication of the "illegal" character of acquiring such data indicates the increased public hazard of the deed, the degree of such hazard being related to such means.

In general, many articles of the Russian Criminal Code stipulate liability for violation of various aspects of privacy (Art. 137, 138, 272 or 273 of the Russian Criminal Code). These components of cries only partially comprise the actions entailing the violation of rules of working with personal data. In our opinion, the "fragmentation" of the said norms cannot result in an efficient law and order maintenance in the sphere of personal data protection.

Thus, it is still unclear if the information about a private life of a person, constituting their personal or family secrecy, is personal data. And how may one distinguish the actions of distributing information (personal data), stipulated by Article 13.11 of the Russian Administrative Code, from the actions of distributing information about a private life of a person, constituting their personal or family secrecy (Article 137 of the Russian Criminal Code)?

Returning to the above said, we should note that the initial version of the Law "On personal data" stipulated the list of personal data including surname, name, patronymic, year, month day and place of birth, address, marital, social, property status, education, profession, income, and other information. However, this clarification is lacking in the present version. To resolve the said problems in the judicial and investigative practice we consider it necessary for the legislator to again stipulate the list of information constituting personal data.

The said list of data will help to distinguish the category of "personal data" from "information about a private life of a person, constituting their personal or family secrecy" and, respectively, administrative law breaches from crimes.

As the norms of administrative liability protecting personal data are currently insufficiently effective, we consider it necessary to stipulate criminal liability for unlawful processing of personal data of a citizen without their consent in case a significant harm is infringed upon their rights and legal interests.

https://doi.org/ 10.54934/ijlcw.v1i2.29

As a rule, the term "significant" is an evaluation category, which causes difficulties in qualification. We believe that a significant harm must be determined depending on what harm was infringed upon public relations, including material loss. Besides, in is necessary to stipulate in comments to Article 137 of the Russian Criminal Code, what will be interpreted as "significant harm".

2.3 Biometrical personal data: criminal legal risks

Criminal-legal protection of personal data, including biometric personal data, is necessarily and logically determined by the accelerated digitalization of public relations. In this regard, the Russian criminal law should take a special position in protecting such public relations from criminal infringements. One should agree with V. A. Chukreyev, who believes that unlawful trafficking of personal, including biometric, data is dangerous due to the fact that an intruder represents themselves as another person.

Biometric personal data serve as the indication of a legal subject, allowing an informational system to identify the specific subject, owner of digital rights.

According to Article 11 of the Law "On personal data", biometric data are the data referred to a specific person. These data indicate physiological and biological features of a person. We believe that this notion is disputable, as the notion "biological' is broader and includes physiological information.

Examination of the current components of crimes in the Special part of the Russian Criminal Code showed that it does not stipulate liability for. In our opinion, this circumstance is a legal gap of the legislator, due to the increased public danger of such deeds. The danger of biometric personal data falsification consists of two aspects. The first is the ability to commit fraud (Articles 159-159^3, 159^6 of the Russian Criminal Code) aimed at stealing other people's property, the second is the ability to obtain unlawful access to computer information (Articles 272 and 274 of the Russian Criminal Code).

Let us illustrate the above said with the following example. Such simple models of biometric data as papillary patterns of fingers (fingerprints), iris or their combination, can be falsified. To falsify a dactyloscopic record one should obtain the original etalon print – a biometric sample or its image. Then one must manufacture it with one of the methods depending on the operation mode of dactyloscopic scanner. Manufacturing contact lens with a fake iris is rather simple. There are Internet sites with

https://doi.org/ 10.54934/ijlcw.v1i2.29

instructions on manufacturing fake fingerprints and iris patterns[5]. Criminalization of such deeds would lead to blocking the resources which contain instructions on breaking biometric-based systems. Many specialists consider the issues of biobanks and data storage (Dankar, F.K., Ptitsyn, A.&Dankar, S.K., 2018).

We believe that manufacturing fake models of biometric personal data should be recognized as a publicly dangerous deed and stipulate liability for committing it, constructing the components of crime as the "formal" one, accomplished at the stage of manufacturing fake models of biometric personal data.

The proposal of criminalizing the components of crime indirectly stems from the Decree of the Russian Government of 6 July 2008 no. 512 "On adopting the requirements for material carriers of biometric personal data and technologies of storing such data outside of informational systems of personal data"[6], according to which the carriers of biometric personal data must provide protection against unsanctioned access, repeated or additional recording of information; it also stipulates the terms of exploitation of the carrier and the possibility to use the qualified electronic signature for maintaining the integrity and , целостности и inalterability of personal data.

At the same time, the public danger of falsifying biometric personal data is rather high and is expressed in infringement upon citizen's rights stipulated by Articles 23, 24, 34 and 35 of the Russian Constitution. Manufacturing, storing, transportation and marketing of falsified biometric personal data is undoubtedly a publicly dangerous deed. Such unlawful actions may serve as a preparatory stage for committing other crimes infringing upon the property of the digital economy actors, including unlawful access to computer information, fraud, forgery of passports contacting chips with biometric data.

A digital etalon model of biometric personal data per se is a *nonmaterial object*. Reproduction of a physical model of biometric personal data based on the digital etalon can be a difficult task. The use of fake biometric data in the digital space is partially covered by the norm of Article 272 of the Russian Criminal Code, while liability for the use of a reproduced physical model of biometric personal data is not

[5]https://www.tadviser.ru/index.php/%D0%A1%D1%82%D0%B0%D1%82%D1%8C%D1%8F:%D0%98%D0%B4%D0%B5%D0%BD%D1%82%D0%B8%D1%84%D0%B8%D0%BA%D0%B0%D1%86%D0%B8%D1%8F_%D0%BF%D0%BE_%D1%80%D0%B0%D0%B4%D1%83%D0%B6%D0%BD%D0%BE%D0%B9_%D0%BE%D0%B1%D0%BE%D0%BB%D0%BE%D1%87%D0%BA%D0%B5_%D0%B3%D0%BB%D0%B0%D0%B7%D0%B0

[6]Decree of the Russian Government of 6 July 2008 no. 512 "On adopting the requirements for material carriers of biometric personal data and technologies of storing such data outside of informational systems of personal data". Collection of legislation of the Russian Federation. 2008. N 28. Art. 3384.

https://doi.org/ 10.54934/ijlcw.v1i2.29

stipulated. A fake physical model can be used for unlawful access to information-telecommunication systems, mobile devices, payment systems, as well as to circumvent restrictions of access control systems, in future – to pass customs control. The use of fake biometric data may infringe property harm, and in cases of intrusion to secure facilities provoke failures in the information systems functioning, technological accidents and catastrophes.

Let us consider the position reflected in clause 1 of the resolution of the plenum of the Supreme Court of the Russian Federation of 17 December 2020 no. 43 "On some issues of judicial practice on the cases of crimes stipulated by Articles 324-327[1] of the Russian Criminal Code", according to which the "official documents, conferring the rights on or releasing from an obligation of, in Article 324 of the Russian Criminal Code, and the official documents in Part 1 of Article 325 of the Russian Criminal Code are such documents, including electronic ones, which are created, issued or verified in the order stipulated by law or other normative act by the federal bodies of state power, bodies of state power of the Russian Federation subjects, bodies of local self-government or authorized organizations or persons (educational, medical and other organizations regardless of the form of ownership, officials and persons executing managerial functions in commercial and non-commercial organizations, examination, medical and other commissions, notaries, etc.) and certify judicially significant facts"[7].

Biometric personal data, which are the main identifying sign in the Unified Biometric System, are not an electronic document, thus the deeds are not qualified according to Article 325 of the Russian Criminal Code. However, falsifying biometric personal data may lead to the consequences similar to Article 325 of the Russian Criminal Code.

Rather frequent are cases of fraud in which wrongdoers may obtain a legitimate (authentic) biometric sample of voice. For example, *in the city of Zelenograd, a criminal case was initiated after a theft from a bank card. A 40 year old local citizen received a telephone call from an unknown person who introduced himself as a bank employee and informed of unsanctioned attempts to write off the money from his cards. The fraudster managed to gain the man's trust by telling the contact data and card numbers, as well as the data from the reverse side of the cards; at that, he did not require any additional information, just asking to answer positively or negatively the question: "Do you agree to block the accounts of the*

[7] Resolution of the plenum of the Supreme Court of the Russian Federation of 17 December 2020 no. 43 "On some issues of judicial practice on the cases of crimes stipulated by Articles 324-327.1 of the Russian Criminal Code". Rossiyskaya gazeta, 30 December 2020.

https://doi.org/ 10.54934/ijlcw.v1i2.29

cards from which unknown persons attempted to write off the funds?" The victim answered "yes", after which he noticed money credited on his card and immediately written off together with his own savings. The overall loss amounted to over 68 thousand rubles[8]. The positive answer of the victim was later used during a session of distant bank servicing.

In the context of this example, it is interesting to note the statistics of banking operations, according to which in 2019 in the Russian Federation 576,566 operations were performed via electronic payment means without the clients' consent; 69% of such operations were performed by the clients themselves under the influence of fraud or abuse of trust[9], and the rest 31% by the wrongdoers obtaining unlawful access to the victims' electronic means of payment (Article 272 of the Russian Criminal Code) and further theft of money (Article 158 of the Russian Criminal Code).

Such cases are already not a matter of the distant future and demonstrate the need to react, including by legal means. For example, in China wrongdoer deceived the personality checking system of the taxation service and falsified consignment bills since 2018. Fraudsters purchased high-quality photos and fake personal data. Using false photos and applications turning photos into videos, they managed to deceive the national face-recognition system. The image is processed so that the photo "moves"; a video is created, which contains the needed actions, including nodding and head shaking, winking, opening the mouth. The fake video was loaded to the especially cross-flashed smart phone. During personality identification, the frontal camera of the gadget was not switched on; instead, the system "saw" the specially produced video. The fraudsters forwarded fake invoices from a fake company, hoping the forgery would not be noticed and the invoices would be paid. In two years, the wrongdoers managed to earn about 57.5 million rubles[10].

In case the Unified Biometric System is contaminated with malware, there are signs of a crime stipulated by Article 273 of the Russian Criminal Code, when the object of crime is the body of public relations of lawful and safe use of the protected computer information. The objective part is the creation of a computer program intended for destruction or modification of the personal data samples stored in the Unified Biometric System.

[8] https://www.zelao.ru/55/540/44070-politsiya-zelenograda-prosit-byit-bditelnyimi-pri-postuplenii-lyubyih-zvonkov-iz-bankov-/

[9] Review of operations committed without the consent of the clients of financial organizations in 2019, prepared by the Central Bank of the Russian Federation. https://www.cbr.ru/Collection/Collection/File/32190/Review_of_transactions_2020.pdf

[10] https://ru-bezh.ru/gossektor/news/21/04/05/s-pomoshhyu-obyichnogo-foto-dva-zhitelya-kitaya-obmanuli-naczion

https://doi.org/ 10.54934/ijlcw.v1i2.29

3. CONCLUSIONS

Ah! ***First***, the institution of personal data, including biometric personal data, is broader than the institution of medical secrecy and includes a broader range of information about a patient. This is due to the fact that the institution of personal data is universal, as it is aimed at regulating public relations in various spheres of public life, while the institution of medical secrecy – in the healthcare system only (has a narrower sphere of action). Consequently, the provisions on personal data protection and their high vulnerability are applicable to all spheres of regulating public relations, not only the relations arising in healthcare.

Second, the title of Article 137 of the Russian Criminal Code should be changed for "Violation of privacy and legislation of the Russian Federation on personal data".

Third, criminal liability should be established for unlawful processing of other personal data which infringed significant harm upon the rights and legal interests of a person, the disposition of the criminal-legal norm being formulated as follows:

"1. Unlawful collection or distribution of information about the private life of a person constituting their personal or family secrecy without their consent or infringing significant harm upon the rights and legal interests of the person as a result of unlawful processing of other personal data, or distribution of this information in a public report, publicly demonstrated work of art or in mass media or in "the Internet" information-telecommunication network...".

Fourth, taking into account a high public danger of the deeds which can be committed using biometric personal data and their value, we consider it necessary to criminalize the components of crime consisting in *manufacturing and (or) marketing of fake models of biometric personal data.*

The said components of crime should be recognized as a publicly dangerous deed and considered as formal components of crime, accomplished at the stage of manufacturing and (or) marketing. We believe that it should be placed within Article 137^1 of Chapter 19 "Crimes against constitutional rights and freedoms of a human and a citizen" of the Russian Criminal Code. Such placement of the components of crime, stipulated by Article 137^1 of the Russian Criminal Code, is determined by the object of criminal-legal protection, which are primarily the constitutional rights of a person.

Fifth, the criminal-legal norm protecting privacy as a constitutional principle does not stipulate the increased liability for distribution of databases (informational systems of personal data) containing, for instance, a medical secrecy, which do not refer to a commercial or banking secrecy, hence, such unlawful actions do not entail liability according to Article 183 of the Russian Criminal Code. We believe that

https://doi.org/ 10.54934/ijlcw.v1i2.29

Article 137 of the Russian Criminal Code must also stipulate a prohibition of unlawful distribution of information systems (or electronic information resources), which contain personal data with restricted access.

Sixth, the protection of biometric personal data should be given more attention compared to personal data, due to their high vulnerability. In this connection, the issues of processing and storing of biometric data should be paid special attention, as their loss may lead to grave consequences. The loss of such data compared to documents cannot be changed, unless an operation is performed.

REFERENCES

[1] Alrefaei, A.F., Hawsawi, Y.M., Almaleki, D., et al. (2022). Genetic data sharing and artificial intelligence in the era of personalized medicine based on a cross-sectional analysis of the Saudi human genome program. *Sci Rep* 12, 1405. https://doi.org/10.1038/s41598-022-05296-7.

[2] Chukreev, V. A. (2022). Personal biometric data as subjects of criminal law protection. *Courier of Kutafin Moscow State Law University (MSAL).* 2022;(3):107-116. (In Russ.) https://doi.org/10.17803/2311-5998.2022.91.3.107-116

[3] Dankar, F.K., Ptitsyn, A., and Dankar, S. K. (2018). The development of large-scale de-identified biomedical databases in the age of genomics – principles and challenges. *Hum Genomics* 12, 19. https://doi.org/10.1186/s40246-018-0147-5.

[4] Istratova, E.E., Molchanov, A.A. (2015). Features of personal data protection in medical information systems. *Journal of Siberian Medical Sciences*. no. 6. p. 59.

[5] Kichko, K., Marschall, P., and Flessa, S. (2016). Personalized medicine in the US and Germany: awareness, acceptance, use and preconditions for the wide implementation into the medical standard. *J. Pers. Med.* 6(2), E15. https://doi.org/10.3390/jpm6020015 .

[6] Lopes, I. M., Guarda, T., and Oliveira, P. (2020). General Data Protection Regulation in Health Clinics. *J Med Syst* 44, 53. https://doi.org/10.1007/s10916-020-1521-0.

[7] Mitchell M., Kan L. (2019). Digital Technology and the Future of Health Systems. *Health Systems & Reform*, no. 5:2. pp. 113-120, https://doi.org/10.1080/23288604.2019.1583040.

[8] Mokhov, A. and Sushkova, O. (2021). *Legal foundations of bioeconomics and biosafety*: monograph. Moscow: Prospekt. pp. 225. DOI 10.31085/9785392310944-2020-480.

[9] Molchanov, A. E., Molchanov, A.A. (2015). Features of personal data protection in medical information systems. *Siberian Medical Journal*, no. 6, p. 59.

[10] Nan Liu, Shiyong Chen (2022). The Protection Mechanism of Personal Health Information in the Digital Economy Environment. *Hindawi Journal of Environmental and Public Health*, Article ID 2314468, https://doi.org/10.1155/2022/2314468.

[11] Raimundo, G. C., Grando, L. L., Machado, ANC, Oliveira, M., and Cabar, F. R. Ethical and bioethical aspects concerning the disclosure of medical information for a fair reason. *Rev Assoc Med Bras* (2022). Feb; 68(2). pp. 202-205. doi: 10.1590/1806-9282.20211043.

ABOUT THE AUTHOR

Albina Shutova – Ph.D. in Law. Senior Researcher of the Institute of Digital Technologies and Law. Associate Professor at Department of Criminal Law and Procedure, Kazan Innovative University named after V.G. Timiryasov, Kazan, Russian Federation.
e-mail: mailto:Shutova1993@inbox.ru

ABOUT THIS ARTICLE

Conflict of interests: Author declare no conflicting interests

https://doi.org/ 10.54934/ijlcw.v1i2.29

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Research article
Journal Link: https://ijlcw.emnuvens.com.br/revista
DOI: https://doi.org/10.54934/ijlcw.v1i2.25

THE EVOLUTION OF THE SIMULATED SIGNATURE BY THE FORGER

Pàvlos Kipouràs
Scuola Forense di Grafologia (SFG), Napoli, Italy
Scuola Superiore di Perizie (SSP), Prato, Italy

Article Information:

Received
September 29, 2022
Approved
October 5, 2022
Accepted
November 13, 2022
Published
December 29, 2022

Keywords:

imitation,
signature,
evolution,
forgery,
simulation

ABSTRACT

Forgery is a very common case of Forensic Document Examination which might refer to several further distinctions of expertise between handwriting and signature. The imitation of a signature could come into effect in different methods or ways, depending on the type of document, the forger's ability and other factors connected to the historical parameters of the case. The ability of the forger to reproduce morphologically the authentic specimen is even related to the range of his graphic variation, his training in forging the specific specimen or other various factors that could affect not only his graphic expression, but also his choices in applying forgery. In cases of long-lasting professional collaboration, the imitation of a person's signature with his consent for a long period of time is a quite often phenomenon. Apart from the legal validity of such signatures, the evolution of the forged signature by the forger is not to be excluded, since the consent deliberates psychologically the forger, diminishes his anxiety and leaves space to a less accurate reproduction of the original specimen. In these cases, there are more parameters to be taken into consideration and the time of habitual execution of the forged signature is crucial, since the repetitive imitation can result in different variations of the original signature's model. The eventual modifications are studied in a practical case which presents several complications.

FOR CITATION:

Kipouràs, P. (2022). The Evolution of the Simulated Signature by the Forger. International Journal of Law in Changing World, 1 (2), 60-72. DOI: https://doi.org/10.54934/ijlcw.v1i2.25

1. INTRODUCTION

The Forensic Document Examiner's (FDE) report is always related to a complexity of factors to be taken into consideration, which are not necessarily connected to the technical and theoretical aspect of each particular case. Apart from the lab inspection of the documents, preferably in their original form, there are many other factors which could orientate the expert's work hypothesis, which should be taken into consideration, examined and cross checked according to the material available (questioned documents and comparative specimens of handwriting or signatures according to the case). It is commonly known that every writer presents a range of graphic variation in every representation of his handwriting or signature [3]. The amplitude of this inevitable variability [4, 11] depends on the cultural level of the writer, his age, his clinical condition in the suspected period, his professional occupation, eventual external factors which affected the graphical production in the particular historical moment of writing a text or signature (such as body's posture, climatic conditions, medication or an exceptional fact could have affected the usual handwriting such as f.e. writing in a bus or train in movement).

Apart from these elements, there is further particular information to be taken into consideration in many cases regarding the personal relations between the parties involved, which deal with the historical connection between them. These relations could indicate other peculiarities of the case which are often decisive to orientate the investigation in a certain direction. Nevertheless, historical events, scientific data, forensic findings and common sense delimit the frame of investigation of every specific case. Undoubtedly, the method used is the (commonly accepted and applied) comparative method, used worldwide in Forensic Document Examination. All deductions are the result of comparison between authentic samples and specimens traced by imitation. The technical term usually used is 'forgery', which, apart from the graphological aspect of comparison between suspected signature and comparative material, also refers to the intent of the forger to defraud [8] in its legal aspect.

2. IMITATION WITH CONSENT

Imitation of a signature is a very common case of forgery in everyday life. The main forger's purpose is the morphological reproduction of the authentic specimen, to deceive the recipient of the

https://doi.org/ 10.54934/ijlcw.v1i2.25

document in practice. Forging is usually an act of fraud, but sometimes it could also aim in facilitating several bureaucratic procedures. In such cases the consent of the original signer is quite often in reproducing the original model or squiggle. For reasons of velocity of execution or easier imitation, forgers usually prefer the squiggle. When a forger practices for a long period of time the imitation of a person's signature's model with his consent, we can notice either slight or severe differences of the form of the final traced signature. Are there specific consequences in the forged signature or squiggle? Which factors could affect the result?

Imitation can be effected by several methods, traditional-mechanical ones, digital ones or even freehand. In the present study we refer to freehand simulation of another person's signature [12]. It is called 'freehand' because the hand remains free from restraints in tracing the model, such as previously traced guidelines [5]. The accelerated rhythm of life in modern societies has created new motives of imitation for practical purposes. The imitation or forgery of a person's signature with his consent in several official or bureaucratic documents is a very often case in practice. On such occasions, the professional role of a certain individual along with the personal relation developed in a mutual collaboration, results in the application of this imitation for a long period of time. One of the most usual cases refers to signing fiscal or bureaucratic documents of a company which deal with its organizing or administrative function and continuity, such as documents deposited to public services of financial control.

It is very often in practice to find out that signatures of the person(s) that legally represent a firm in its bureaucratic function are not genuine, but imitated f.e. by the accountant of the firm or someone of the responsible employees of the financial or even legal department (depending on the public bureau in which the document should be deposited). The use of the imitated specimen of the original signature usually happens with the consent of the person who is legally assigned to sign, as f.e. the legal representative of the company. In these circumstances it is very common that after a long period of practice the forger/imitator achieves a particular automatism [9] in imitating the original signature, which leads him to evolve the forged model in an individual way by applying several morphological or even qualitative changes in the original signature's model, which might be compatible or not with his own (the forger's) original specimen. A very common preference in these cases is the use of a squiggle more than a more extended in length signature, because it is easier, quicker in the execution, and less indicative or characteristic of the forger's hand. The danger of recognition of the imitation and the difficulty of the task to be performed is considerably reduced in case of a short signature such as a squiggle. An amplified range

https://doi.org/ 10.54934/ijlcw.v1i2.25

of variation [15] of the original signer is also in favor of the forger, since there is a wider field of satisfying compatibility to the original specimen. Such copied signatures could be rather difficult to be proved simulated [5].

Particular attention should be given to initial or ending strokes which are rather individual characteristics. Such strokes may contain even on-air movements of the pen, not imprinted on the surface of the paper because of lack of contact between the point of the pen and the paper. They can be decisive in order to distinguish between fake and original specimens from the aspect of forensic diagnosis. In addition, the quality of the line, relative speed of writing, ratios of the various parts of the signature or of the particular morphemes [13] are further sources of problem of the forger in order to create a satisfying copy of the original.

After a long period of training in practice, forgers very often come to a signature's model, which may be morphologically different to the original specimen. This morphological evolution usually becomes automated and arrives in a formal aspect, which may be slightly or even significantly different to the genuine signature's model. By practicing, our own graphical characteristics become more and more automated. This is valid not only for our own handwriting, but even when we try to imitate another person's handwriting or signature. Practicing leads to automated intricate movements, which become more individual and formulate personal graphical habits [16].

Imitation as a graphic procedure is quite complicated and a successful result is rather difficult to achieve, because the writing task does not flow from unconscious habit [14]. The mechanism of imitation is divided into 3 main stages according to the **ElAdApp** Model [10]:

The **El**imination stage (suppressing of the forger's own habits in handwriting);

The **Ad**option stage (the forger tries to simulate the signature or handwriting of another person);

The **App**lication stage (the forger has practiced extensively trying to suppress his own habits in handwriting and to imitate the genuine item, before producing the final document where he has to apply contemporaneously the above 2 stages).

The consent of the original signer permits wider margins of graphical expression of the hand. Consent could be either oral or written. If written, it is easier for the forger to defend himself in an eventual

https://doi.org/ 10.54934/ijlcw.v1i2.25

penal procedure, since the consent is equivalent to permission or authorization to do so. An oral consent is less easy to be proved in case of judicial involvement. Nevertheless, the consent allows to the forger wider margins of action, since he is not feeling so restricted in remaining as close as possible to the morphology of the specimen to imitate. According to his own range of graphic variation, to this graphical skill and fluency, but even to his individual ability to reproduce the forged signature, he may gradually abandon the original model due to his psychological freedom deriving from the consent. Under these circumstances, there could arise several eventual modifications or alterations of the original model.

If we have the opportunity to examine different specimens throughout time, we could notice a graduated diversion which is more intense in the latter specimens. Forged specimens of the beginning tend to be more closely attached to the original model in the morphological aspect. Later, there appear slight differences, which might be related less to the form and more to the qualitative aspects of tracing. It is the stage of minor effort to eliminate one's own individual graphical habits. Then, the morphological compatibility between original and forged signature is further reduced and new forms appear, that might be compatible either to the original signature of the forger or to a completely new model of his inspiration. The possible direction of orientation of the forger in this ideological conception of the new signature's model is quite unlimited. Diachronic execution of the habitual reproduction of the imitation is rather a factor of increase of the differences along with the psychological deliberation of the consent. The forger could finally arrive in a completely irrelevant morpheme, extremely diverse from the original specimen.

We have to point out that signature and handwriting are continuously subject to evolution and variation to every single writer [7]. Since this axiom is valid for every individual, it covers not only the cases of authentic production of handwriting, but it is present as a tendency even in simulated specimens. Evolution is a stable characteristic of human nature and this is the reason why the forger can't deviate from this path. Evolution can be meant even from a negative perspective. Elderly people are usually less fluent in their handwriting execution because of several malfunctions of the neuromuscular system due to age or clinical problems. Imitation of such a signature with grapho-pathological characteristics is much more complicated and difficult, since the forger is usually younger as the social and professional collaborations indicate in practice. Employees who are rushing to organize tasks are usually younger people to whom the usually older employers assign bureaucratic tasks. Even pharmaceutical treatments could affect the quality or morphology of an original signature, which can be transitory. Learning to copy a specimen of this kind though, may affect the conception of the original model following that pattern

https://doi.org/ 10.54934/ijlcw.v1i2.25

even after the cure of the original signer. Forgers following and learning a certain copy will not easily change the initial pattern, since they are not likely to re-examine the model to imitate. Once acquired, the pattern remains quite stable, even because of the effect of different kinds of psychological biases [1].

The procedure of imitation encompasses the graphic gesture of the forger. The morphological reproduction of the model demands a particular series of muscle movements of the body parts involved in handwriting. The order of the brain to the body to execute a particular task in order to write involves not only the brain, but even the upper part of the body (shoulder, hand, fingers), till the material production of graphic traces on the surface of the paper. Copying the original pattern presupposes the initial observation and analysis of it by the simulator. On many occasions the forger has managed to identify the morphemes and shapes to reproduce, but he has not ideologically conceived sufficiently the sequence of movements required for a successful simulation. According to phychomotor theory, forging is an untrained motor task which is accomplished through visual feedback, so as to identify the shape characteristics [6]. The sequence of the strokes though and the clockwise or anti-clockwise direction of tracing the lines in every specific part of the signature is not always successfully diagnosed by the forger. Clockwise movements demand the motivation of several muscles while anti-clockwise movements activate other muscles or groups of them [10]. If there are intrinsic faults in simulation due to the lack of accurate analysis of the model to imitate in the initial phase (in the first chronological phase of the suspected period), then a quite altered model can become the starting basis of the evolution of the forged sample, which, undoubtedly, will increase the discrepancies between the standard signature's model and the forged one. The evolution of the forged model acquires a completely autonomous route. It is something like a clone of the original one, which follows a separate process of evolution, especially because the forger is liberated by the psychological necessity of commitment to the original model, as a result of the consent of the original signer.

We have to take into consideration the fact that handwriting, then, can be abnormally affected by several external factors without the writer intentionally giving thought to it. The acquired graphic skill and ability to apply handwriting as a process of defining ideological meanings by writing words, decreases or completely disappears the anxiety of how individual letters are formed [5]. This is valid even in the normal handwriting or signature of the forger, so it could be a further parameter of influence for him, since the fact that he is not obliged to follow the model because of the consent of the original signer allows a more intense automation. Hence, the factors of diversification become more and more numerous.

https://doi.org/ 10.54934/ijlcw.v1i2.25

The aforementioned aspects and thoughts are examined in the following case study.

3. CASE STUDY

3.1 The historical data. A businessman, owner of a company which, apart from other activities deals with the management of hotels, collaborates for almost 20 years with an accountant, which is responsible for all the fiscal documentation of the financial management of the company. With the consent of the president of the company, the accountant imitates his signature in every necessary document, when the president is not present. The original signer uses 2 kinds of signing models; an extended one and a squiggle. In the beginning, the accountant tries to imitate the extended specimen, which is more complicated and more difficult to reproduce. After a while, for reasons of simplicity and fast execution, the accountant starts copying the squiggle. Because there is no conflict between them, the accountant is not trying so hard to imitate the genuine specimen, but he starts evolving and simplifying the original squiggle by elaborating the model in his own personal way. In the beginning of the financial crisis the businessman is in economical difficulty and gets a loan of 60.000€ by his accountant, in a condition of a high interest. After the full repayment of the amount, the accountant presents 10 exchange rates of 60.000€ each, and claims and amount of 600.000€ starting a legal prosecution both in penal and civil procedure. After the nomination of a court's expert to decide whether the suspected signatures are genuine or not, the accountant presents to the Expert a certain quantity of documents, which were supposed to have been signed by the president and which, in fact, were signed by him on behalf of the original signer. Of course, these documents were signed by the accountant before the suspected period, with the oral consent of the businessman, because of the mutual confidence between them due to their collaboration for more than 10 years in that time. The accountant even presented to the FDE expert documents in which the imitated squiggle is authenticated by the police, because of the fact that, very often, since the police officer knew in person both the accountant and the businessman, if the last one was on a trip, the accountant was reproducing the president's squiggle and the police officer was confirming the originality of the signature, in documents of procedural bureaucratic value and interest. When these specimens were provided in the expert's comparative material, he couldn't exclude them, because they had an undeniable proving inference of originality. So, apart from the legal actions to be taken in order to indicate the 'construction' of false evidence, the Technical Advisor had to prove the forgery of the authenticated specimens, by

https://doi.org/ 10.54934/ijlcw.v1i2.25

comparing them not only to the original ones but even to the other squiggles produced by imitation, indicating the different evolution of the forged squiggle in relation to the genuine one.

3.2 Authentic and suspected specimens. The morphological aspect of the genuine signature and squiggle is the following:

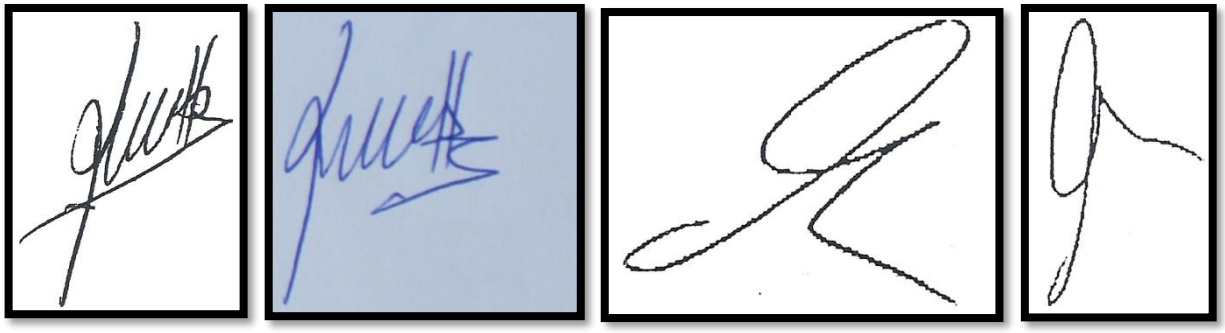

Fig.1. the original signature (2 specimens on the left) and squiggles (2 specimens on the right).

The 10 suspected specimens are the following:

https://doi.org/ 10.54934/ijlcw.v1i2.25

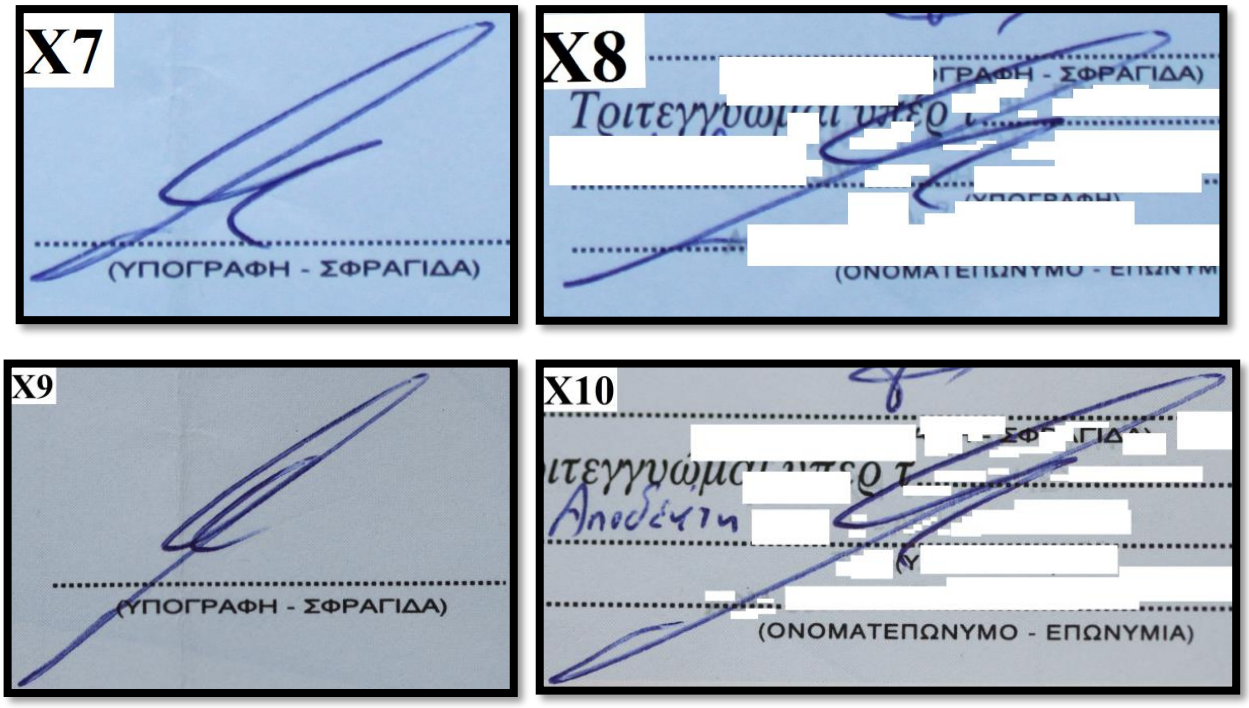

Fig.2. the suspected squiggles.

The specimens of the accountant imitating the original squiggle are the following:

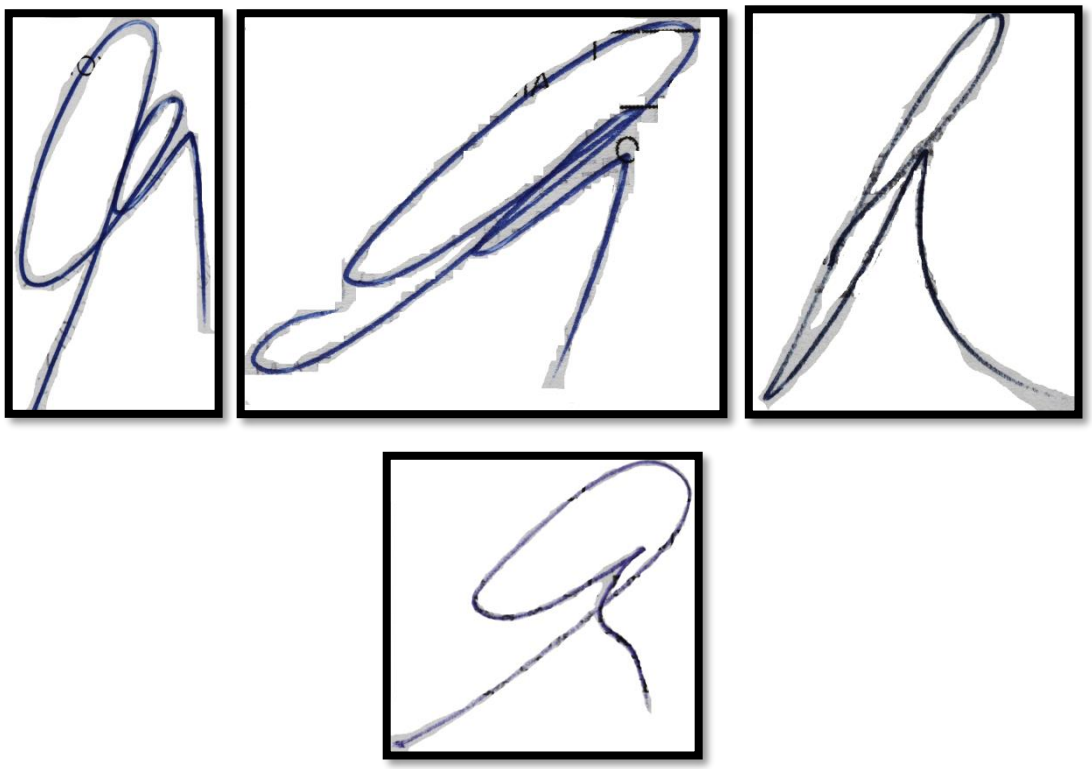

Fig.3. the simulated specimens.

https://doi.org/ 10.54934/ijlcw.v1i2.25

The specimens made by the accountant and authenticated as squiggles of the president are the following:

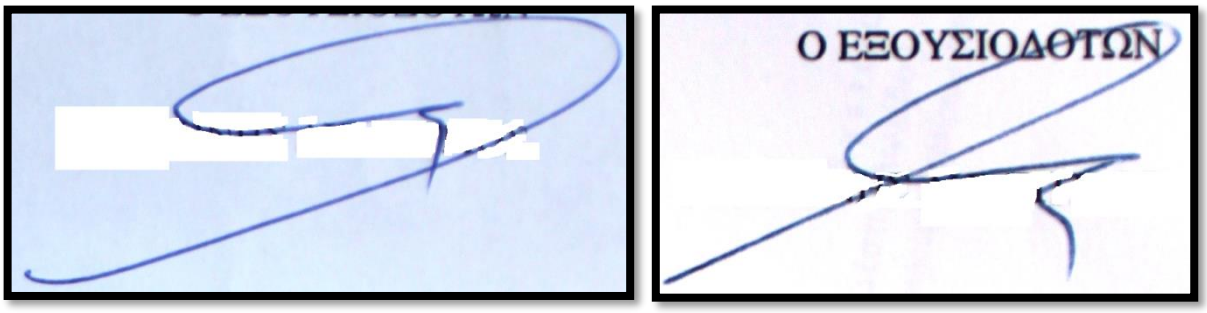

Fig.4. authenticated simulated specimens.

We can see the compatibility between the imitated squiggles and the suspected ones, but our aim in this study is to diagnose the differences between the genuine squiggle and the evolution of the imitated one.

3.3 Differences between the evolved specimen and the genuine one. Differences do exist, although the slight difference in the morphological appearance between the forged and the original specimens could raise the hypothesis whether the forged ones are alternative expressions of the genuine hand within the margins of its natural graphical variation. We notice the following discrepancies:

Different proportions in the analogical aspect of the expansion of the signature in the vertical and horizontal vector in each morphological component of the forged model,

Different ratio between the first and the second form or part which constitute the squiggle,

Elimination of the dots or small traits in the final part of the genuine squiggle,

More intense inclination of the imitated squiggles,

Different grade of convergence of the axes between the 2 parts of the squiggle,

Different rhythm of execution (velocity),

Different distribution of graphic pressure (due to the different neuromuscular structure).

https://doi.org/ 10.54934/ijlcw.v1i2.25

4. CONCLUSIONS

In every expertise we have to take into consideration 2 very important factors:

- The **historical data of the case** which can orientate our investigation in a safer direction,
- The **range of graphic variation of a hand's graphic expression** during the suspected period as defined by the comparative material.

In case of habitual imitation of a forged signature, the forger can arrive in an evolution of the genuine specimen, which could be adapted or not in his own graphical characteristics. The changes vary in every particular case depending on:

- the **forger's ability** to reproduce the forged specimen,
- **his own range of graphic variation**,
- the **period of time** of training because of the reproduction of the forged signature,
- the **quantity** of the forged signatures he has to sign,
- the **conditions** under which he is signing using the forged specimen (signing in his office or in public services in front of other persons, under pressure of time).

The most common differences regard:

- differences which have to deal with the **ratio of the forms**,
- **inclination**,
- **velocity of execution and rhythm**,
- factors of adaptation to **his own ideological achievement of the imitated signature**, which may lead to a partial reproduction of his own form of signature,
- differences of distribution of the **graphic pressure**.

https://doi.org/ 10.54934/ijlcw.v1i2.25

We have to notice that the forger usually and logically tries to remain as much as possible close to the original morphology, so as to be able for him to present a signature which could be considered genuine. That is the reason why we, initially, do not expect a completely different morphological aspect between the genuine specimen and the forged one [2]. The simulator will endeavor to reproduce the signature model as pictorially as possible [12]. The consent of the original signee though allows a vast field of graphic expression from the psychological aspect. The forger, deliberated by the necessity of reproduction creates a mixture of both qualitative and morphological elements which contain not only characteristics of the model to imitate, but might also belong to his own graphic nature, or result as a consequence of his inspiration. Further investigation from this perspective in different cases is necessary. When a forger is left free to act, the product of his imitation cannot be restricted to certain rules or expected findings.

REFERENCES

[1] M. Allen, Foundations of Forensic Document Analysis, Theory and Practice, Wiley Blackwell, 2016, p.11-12.

[2] A. Bravo. Variazioni Naturali e Artificiose della Grafia, (Urbino : Libreria Girolamo Moretti, 1998), p. 136.

[3] A. Bravo. Variazioni Naturali e Artificiose della Grafia, Urbino, Libreria Moretti Editrice, 2005, p. 33, with reference to : Girolamo Moretti. Perizie Grafiche su base Grafologica, (Verona, L'albero, 1942).

[4] A. and P. Cristofanelli., Grafologicamente, Manuale di Perizie Grafiche, (Roma : CE.DI.S. EDITORE, 2004), p. 231.

[5] D. Ellen, The scientific Examination of Documents, Methods and Techniques, 2nd edition, Taylor & Francis, 2003, p.31, 34, 37.

[6] K. Franke, Analysis of Authentic Signatures and Forgeries, Computational Forensics, 2009, Vol.5718, p.150-151.

[7] J. Gideon, A. Kandulna, A.A. Kujur, D. Ad, R. Kumundha, Handwritten Signature Forgery Detection using Convolutional Neutral Network, www.sciencedirect.com, Procedia Computer Science 143 (2018) 978–987.

[8] H. Harralson, Developments in Handwriting and Signature Identification in the Digital Age, Elsevier, 2013, p.6,

[9] R. Hubber and A.M.Headrick, Handwriting Identification: Facts and Fundamentals, 1999, CRC Press, Ch.5, par.28,

[10] P. Kipouràs, Evidence for a 3-stage Model for the Process of Free-hand Forgery of Signatures and/or Handwriting, IJISET - International Journal of Innovative Science, Engineering &

https://doi.org/ 10.54934/ijlcw.v1i2.25

Technology, Vol. 8 Issue 1, January 2021 ISSN (Online) 2348 – 7968, http://ijiset.com/vol8/v8s1/IJISET_V8_I01_23.pdf, p.238-249.

[11] P. Kipouràs, C. Kosmidis, D. Skarpalezos**,** Why Two Genuine Signatures are never Identical in Practice: Evidence and Scientific Explanation, IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 8 Issue 4, April 2021 ISSN (Online) 2348 – 7968, https://www.ijiset.com/articles.html**,** https://ijiset.com/articlesv8/articlesv8s4.html**,** https://ijiset.com/vol8/v8s4/IJISET_V8_I04_18.pdf, p.157-173.

[12] L. Mohammed, Forensic Examination of signatures, Academic Press, Elsevier, 2019, 50-60, 65.

[13] R. Morris, Forensic Handwriting Identification, Fundamental concepts and principles, Academic Press, 2000, p.109.

[14] S. Slyter, 1995, Forensic Signature Examination, Charles Tomas Publisher, p.7.

[15] N. Stergiou, L. Decker, Human Movement Variabilty, Nonlinear Dynamics, and Pathology:Is there a connection? Hum Mov Sci. 2011 October ; 30(5): 869–888. doi:10.1016/j.humov.2011.06.002.

[16] L. William, Forensic Laboratory Handbook Procedures and Practice, Second Edition, Humana Press, p.372.

ABOUT THE AUTHOR

Pàvlos Kipouràs – Ph.D. in Law, Faculty of Law & Commerce at Eduvos, in East London, South Africa. Advocate of the High Court of South Africa.
e-mail: kippaolo@gmail.com
ORCID ID: https://orcid.org/0000-0002-4021-7584
Google Scholar ID: https://scholar.google.com/citations?hl=en&user=h_w4XXAAAAAJ

ABOUT THIS ARTICLE

Conflict of interests: Author declare no conflicting interests

https://doi.org/ 10.54934/ijlcw.v1i2.25

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Research article
Journal Link: https://ijlcw.emnuvens.com.br/revista
DOI: https://doi.org/10.54934/ijlcw.v1i2.33

CRIMINAL-LEGAL PROTECTION OF ROBOTICS: NOTION AND CONTENT

Ildar R. Begishev
Institute of Digital Technologies and Law, Department of Criminal Law and Procedure, Kazan Innovative University named after V.G. Timiryasov Kazan, Russian Federation

Article Information:

Received
November 17, 2022
Approved
November 18, 2022
Accepted
November 18, 2022
Published
December 29, 2022

Keywords:

robotics,
artificial intelligence,
criminal-legal protection, liability,
crime

ABSTRACT

Robotic devices are more and more often used when committing crimes. Further, this trend will grow, which will significantly increase the inflicting potential of socially dangerous infringements and the harm from their commitment. It testifies to the necessity of an objectively formulated and relevant request for elaboration of modern approaches to criminal-legal protection of public relations associated with robotics. Such protection includes a complex of measures and ensures security of handling robots, from the moment of their creation till the moment of utilization. The work makes an attempt to elaborate the notion of criminal-legal protection of robotics and to define its content. We propose to interpret criminal-legal protection of robotics as an interconnected system of provisions shaping the criminal-legal policy in the sphere of development, production, and application of robots, as well as the liability for socially dangerous infringements committed with the use of robots and in relation to robots.

FOR CITATION:

Begishev, I. R. (2022). Criminal-Legal Protection of Robotics: Notion and Content. International Journal of Law in Changing World, 1 (2), 73-83. DOI: https://doi.org/10.54934/ijlcw.v1i2.33

1. INTRODUCTION

The digital technologies underlying Industry 4.0 entail drastic changes in all spheres of human activity [5]. Today, robotics, alongside other cross-cutting technologies, is among the key drivers of digital economy. Robots are successfully used in industry and construction, healthcare and education, in everyday life, in agriculture and communal services, in military and space spheres, and in many other fields. At the same time, they create significant and growing risks for public relations protected by criminal law.

Innovative technologies of robots' creation and production demonstrate exponential growth: the created machines acquire new characteristics which significantly expand their functionality; hence, the elaborated and prospective robots may fall out of the legal framework, as they are not identical to any item recognized as an object of respective legal relations. Today, development and use of various robotic devices is already an objective reality. At the same time, robots are permanently transforming and expanding the boundaries of their functional capabilities, thus accordingly changing the character, forms, methods, means and techniques of human interaction with them.

Sustainable and safe development of robotics is an important task of the state; its successful implementation would allow opening new economic markets, changing the current global trading and financial relations. The said processes necessitate the creation of mechanisms for control and monitoring over the actions of robots and for protection of public relations arising at the stages of their creation and functioning.

Thus, the criminal-legal science faces the task of utmost importance – to provide sustainable, steady and safe development of the Russian robotics. An important role in these processes is also played by the elaboration of mechanisms of criminal liability for infringing harm using robotic devices.

2. METHOD

We used general scientific (formal logic, systemic analysis, analysis, synthesis, induction, deduction, analogy, interpretation) and specific scientific (comparative-legal, formal-dogmatic, the method of legal norms interpretation) methods, which allowed considering in more detail the problem of

https://doi.org/10.54934/ ijlcw.v1i2.33

defining the notion and content of criminal-legal protection in general and, in particular, criminal-legal protection of public relations associated with robotics.

3. NOTION OF CRIMINAL-LEGAL PROTECTION

Unfortunately, the wording of the Criminal Code of the Russian Federation (further – CC RF) does not provide a definition of the notion of criminal-legal protection. This, on the one hand, creates the risks of nonuniform interpretation of this phenomenon, and on the other hand, necessitates the study and account for the provisions of the legal doctrine. However, it should be noted that Part 1 of Article 2 of the said Code defines its tasks as "protection of rights and freedoms of a human and citizen, property, public order and public safety, environment, and constitutional system of the Russian Federation against criminal infringements, provision of peace and safety of humanity, and prevention of crimes"[1]. One may assume that this list reveals, inter alia, the protective function of criminal law.

B.T. Razgildiev defines criminal-legal protection as "criminal-legal preservation of a personality, society, state, peace and safety of humanity against probable criminal impact on them, executed on a definite territory and during a definite time period through a non-personified threat of punishment by law-enforcers" [14]. A.N. Saygashkin interprets criminal-legal protection as the "emerging at a certain stage of historical development, objectively necessary socially useful activity of specially authorized public bodies providing security of the protected objects through implementing criminal-legal prescripts" [15]. Further, he asserts that protection comprises defense, that is, it "contains two components, two constituents: 'passive' – the waiting and control phase (protection in the narrow sense) and 'active' – the action phase, reaction to a being committed or having been committed dangerous act or unwanted change (defense)" [15]. The described "waiting and control phase" can be considered a stage of the authorized public bodies and other stakeholders to a reaction to probable future criminal actions, which, undoubtedly, has also a preventing significance. V.E. Bondarenko assumed that criminal-legal protection "is a regime of executing the obligation not to commit criminal infringements upon the objects stipulated in criminal law under the threat of criminal punishment" [4]. At that, the researcher states that "the ground for criminal-legal protection is the presence of social relations regulated by positive branches of law, suffering

[1] Criminal Code of the Russian Federation of 13 June 1996 no. 63-FZ // Collection of legislation of the Russian Federation. 1996. No. 25. Art. 2954.

https://doi.org/10.54934/ ijlcw.v1i2.33

losses from socially dangerous infringements" [3]. One may assume that, in general, she fits in with a rather original development of the concept of juridical liability, both positive and negative.

It should be noted that criminal-legal protection is applicable to objects viewed as social values significant for the modern state [9]. The most popular opinion among the Russian experts in criminal law is that the objects of criminal-legal protection are social relations. A.V. Naumov believes that "the protective task of criminal law is its main historic task, independent of a political order of the respective state of its economic features" [13]. He distinguishes two aspects of the protective task of criminal law, referring to them both general prevention of criminal law, i.e. prevention of citizens' committing a crime under the criminal-legal prohibition, and its private prevention, which is interpreted as prevention of committing new crimes by the persons who have already committed some crimes [13]. One may conclude that he interprets criminal-legal protection as an institution with a rather broad content. At the same time, the possibility of other tasks is not excluded.

It is worth noting that some experts assert other, besides protective and preventive, tasks of criminal law, for example, a regulative or similar task. For instance, N.V. Genrikh marks that the object of criminal law may be only certain social relations, occurring in relation with committing a crime, which criminal law organizes and regulates, which guarantee a human right for freedom, security and justice [8]. However, the claimed approaches were not essentially supported by other researchers. At the same time, it should be noted that the regulatory function of law is the main one.

4. CRIMINAL-LEGAL PROTECTION OF ROBOTICS

Criminal-legal protection of robotics appears to have its own specificity, based on the following circumstances. Introduction of digital technologies, including robotics, into social practices in characterized by exponential growth, which logically entails large-scale and rapid changes in many spheres of social life. This, in turn, requires, on the one hand, prompt, and on the other hand – reasonable reaction taking into account achievements of diverse fields of knowledge: engineering in the broad sense, industry, defense, medicine, etc.

We agree with the opinion of researchers who assert that information-telecommunication technologies, information systems and digital devices today constitute an inseparable part of life of a

modern society and comprise all resources ensuring management of information [11]. Besides, it should be noted that the growth of the number of spheres of social life in which digital devices, including robotic devices, are actively used has entailed a change in the crime structure. However, even more significant and complex transformations seem to be coming in relation with the phenomenon under study.

As is well known, robotic devices are a comprehensive object [7] including two constituents:

– the software constituent, including programs providing the functioning of a robot, its execution of certain functions, the list and boundaries of which are predetermined by the installed algorithms of actions;

– the technical (hardware) constituent, which is the mechanical part of the device – construction elements, drives, wire system, sensors, radars, lidars, etc.

The specificity of robots as complex digital objects requires unconditional accounting of their features when elaborating the normative-legal regulation of public relations involving them.

Robots, being endowed with processor capabilities and able to store, process and transmit information, play a more and more significant role in industrial production and servicing. The increased exploitation resource, the possibility to model the performed function by making changes in a program, the high precision of performing certain operation – all this determines great attention to robotics, and this attention is both positively and negatively evaluated from the viewpoint of law.

Robotic devices are more and more often involved in committing crimes. In future, this phenomenon will increase, which will to a large extent magnify the inflicting potential of socially dangerous infringements. The above said forms the agenda of counteracting criminal risks determined by robotics introduction and actualizes the issues of elaborating the criminal-legal norms to provide protection of public relations from the infringements complicated by the use of robotic systems.

From the viewpoint of modern criminal law, a robot (a device, a system, a complex) may be a means of committing a crime and an object of infringement. In relation to the latter, we should note that a robot can hardly be equaled to other means of computational technologies. A distinctive feature of a robot is the capability to commit certain actions not associated with storing, processing, and transmitting of digital information, like, for instance, relocation, moving along automobile roads or in the air space. As a

https://doi.org/10.54934/ ijlcw.v1i2.33

natural result, these capabilities significantly broaden its functionality and, accordingly, increase the public danger of its use [2].

Notably, in case of committing an unlawful deed in relation to a robot, the latter is considered to be a property and thus is subject to criminal-legal protection on general grounds. However, infringement upon certain types of robots do harm to the objects of criminal-legal protection of other types. In other words, such deeds may be multi-object ones.

For example, if a robotic device belongs to the category of an aerial vehicle or water transport by its purpose, target use and technical characteristics, then its hijacking or capture is qualified as a crime stipulated by Article 211 CC RF "Hijacking of an aerial or water transport or a railway vehicle".

Besides, if a robotic device is equipped with armaments, ammunition, or explosives, an infringement upon it, in case of the presence of other signs of this crime, is qualified according to Article 226 CC RF "Stealing or extortion of armaments, ammunition, explosives or explosive devices".

Thus, the current criminal legislation does not consider a robot to be the sign enabling to differentiate liability for commitment of the said deeds. Nevertheless, we believe that robotic devices, due to their inherent properties, in case of infringements upon them which entailed unlawful appropriation, present an increased public danger, as they possess an increased inflicting capability.

Legal scientists express well-grounded concern about the degree to which the current legal environment, including criminal-legal regulation, is adapted to active introduction of robotics into social relations [1, 6]. We believe that these opinions are rather substantiated. Indeed, a robot cannot be fully equaled to material objects which the modern criminal law considers to be objects of individual crimes. At the same time, the elements of crimes characterizing the means of committing crimes do not comprise a robot as a standalone unique object of the material world. One can hardly compare a robotic device with armaments, explosives, explosive devices, or computation means. Being a cross-cutting digital device, a robot may combine the essential features of all the above items. At the same time, in our opinion, there are certain infringements where a robot may significantly increase the public danger of the committed deed, which deserves differentiation of liability.

For instance, robotics determines the possibility to perform the objective part of infringement when a subject is at a remote distance from the criminal event. This property is determined by the possibility of

https://doi.org/10.54934/ ijlcw.v1i2.33

a robot to be remotely controlled over a long time, the capacity of the battery maintaining the device functioning, the stability of the data transmittance channel which allows receiving control signals at a large distance.

Besides, modern robots are equipped with engines of sufficient capacity which, combined with supporting elements in the external store, makes it possible to endow the robot with certain loads. These can be both explosives and explosive devices. The most obvious example is robots – unmanned aerial vehicles (further – UAV).

Rather significant is the fact that robotic devices can move in various environments – on the ground, in the aerial, space and water environment; there are also no barriers for creating underground robots if needed. These characteristics, if used for committing a crime, may essentially increase the harm infringed by a publicly dangerous deed.

Besides, robots having appropriate software may coordinate their actions with each other, transforming infringements of a single device into mass infringements, which also significantly increases the public danger of the deed. In this case, undoubtedly, one cannot speak of co-partnership, as robots are not subjects of crimes. However, one may imagine the harm from an armada of UAVs equipped with explosive devices and coordinate blows with each other.

Stemming from tactical-technical characteristics of a robot as a means of committing a crime, it can inflict the largest harm in those infringements which are associated with destruction of objects, horrification of the population, delivery of explosive devices, etc.

At the same time, the current edition of CC RF does not contain the elements of crimes in which a robot is considered to be a sign characterizing a means of committing a crime.

The provisions of the general part, namely clause “k” of part 1 of Article 63 CC RF “Circumstances aggravating punishment”, allow making a criminal-legal assessment of infringements complicated with the use of robots, imputing commitment of a crime with the use of specially manufactured technical means as a circumstance aggravating punishment. In our opinion, such practice is beneath criticism. This norm can be applied only if the robot was “specially manufactured” for committing the crime; such wording does not allow incriminating this provision in cases of a voluntary intention and in situations when an industrially produced robot was used to increase the inflicting capacity of the publicly dangerous deed.

https://doi.org/10.54934/ ijlcw.v1i2.33

Thus, it appears possible to conclude that modern criminal law has a potential for improvement in the part relating to:

– differentiation of criminal liability for infringements committed in relation to various types of robotic devices;

– establishing increased criminal liability for infringements, the objective part of which includes the sign of using (applying) a robot.

This opinion to a large extent relies on the thesis of increased inflicting capacity of a robot, which can be substantiated by the following arguments.

The presence of a software component in a robot determines the possibility to use it not just as a means increasing the inflicting potential of human actions, but also as a highly autonomous mechanism which is actually capable of independently and fully accomplishing the objective part of the crime. In this case, human participation is reduced either to entering a relevant command through the robot's control unit, or to knowingly programming the robots for their participation in committing crimes [12].

In addition to the above, it should be noted that the existing robots act through executing algorithms of actions initially entered by the developers into the digital code of their software. In other words, such robots are capable of performing an explicit, limited list of actions, directly determined by the capabilities of the program embedded in them. However, the progressive development of artificial intelligence technologies suggests the future trend towards significant increase of robots' autonomy.

It is worth clarifying that artificial intelligence differs from software in the available functionality, while by their physical nature both are a digital code. However, the functionality of artificial intelligence allows imitating human cognitive functions, carry our self-training and search for solutions beyond the frameworks of the previously established algorithm. In other words, based on the independent analysis of the environment variables, and commands received from an operator, a system is capable of autonomously choose the algorithm of actions through which the said commands would be executed. In this case, the issue of the subject of liability for the harm infringed by an autonomous robot (a robot in which the artificial intelligence technology is applied) is not sufficiently obvious.

https://doi.org/10.54934/ ijlcw.v1i2.33

Besides, using a robot for committing crimes is possible in situations when an operator (a person controlling the robot) is at a large distance from the place of infringement. The increasing capabilities of robots in terms of period of autonomous operation, increased capacity of their batteries, larger radius of control means, noise immunity of control signals create conditions for committing socially dangerous infringements at a significant distance from a criminal.

In addition to the above, modern robots demonstrate capabilities of moving loads of significant size and weight, and the working load of UAVs is growing hyperbolically. In our opinion, this technical characteristic can also be used for committing various crimes: terrorist attacks, unlawful crossing of the state border of the Russian Federation, contraband traffic, etc.

5. CONCLUSIONS

The above testifies to the need to objectively formulate a relevant request for elaborating modern approaches to criminal-legal protection of social relations associated with robotics. It is proposed to interpret such protection as an interconnected system of provisions shaping the criminal-legal policy in the sphere of development, production and application of robots, as well as the liability for socially dangerous deeds committed with the use of robots and in relation to robots. Such protection includes a complex of measures and ensures security of handling robots, from the moment of their creation till the moment of utilization. As was stated above, by their criminal-legal nature robots can be objects of criminal infringements or means of committing crimes. Robots as material objects having, due to their inherent properties, an increased potential for infringing harm to the social relations protected by law, create a complex of risks and threats which require both actual and prospective measures of counteraction. Effective protection of social relations associated with robotic devices is insufficient within the existing criminal-legal means. Legal provisions of criminal law must take into account individual features of robots, causing the need to improve the existing norms and elaborate new provisions of the criminal law.

https://doi.org/10.54934/ ijlcw.v1i2.33

REFERENCES

[1] Baranov, P.P. (2018). Pravovoe regulirovanie robototekhniki i iskusstvennogo intellekta v Rossii: nekotorye podkhody k resheniyu problemy [Legal regulation of robotics and artificial intelligence in Russia]. *Severo-Kavkazskiy yuridicheskiy vestnik*, 1, pp. 39–45.

[2] Begishev, I.R. (2022). *Avtonomnaya robototekhnika v sisteme ugolovno-pravovykh otnosheniy* [Autonomous robotics in the system of criminal-legal relations]. Moscow: Prospekt.

[3] Bondarenko, E.V. (2014). *Osnovanie ugolovno-pravovoy okhrany i ee prekrashchenie* [Grounds for criminal-legal protection and its termination]. Abstract of a PhD (Law) thesis. Saratov.

[4] Bondarenko, E.V. (2019). Ponyatie ugolovno-pravovoy okhrany [Notion of criminal-legal protection]. *Voprosy rossiyskogo i mezhdunarodnogo prava*, 9(3-1), pp. 224–230.

[5] Gromova, E.A., Koneva, N.S., Titova, E.V. (2022) *Legal barriers to the implementation of digital industry (Industry 4.0) components and ways to overcome them* Journal of World Intellectual Property, 25(1), pp. 186-205.

[6] Efremova, M.A., Lopatina, T.M. (2021). *Robototekhnika v ugolovnom zakonodatel'stve Rossiyskoy Federatsii* [Robotics in the criminal legislation of the Russian Federation]. *Rossiyskiy sledovatel'*, 11, pp. 55–58.

[7] Gabov, A.V., Khavanova, I.A. (2018). Evolyutsiya robotov i pravo XXI veka [Evolution of robots and law in the 21st century]. *Vestnik Tomskogo gosudarstvennogo universiteta*, 435, pp. 215–233.

[8] Genrikh, N.V. (2010). *Predmet ugolovnogo prava: genezis nauchnoy mysli i problemy sovremennoy interpretatsii* [Object of criminal law: genesis of scientific thought and problems of modern interpretation]. Moscow: Yurlitinform.

[9] Kabanov, P.A., Sadeyev, M.M. (2009) *Some victimological characteristic's aspects of economic fraud in the Republic of Tatarstan*, Criminology Journal of Baikal National University of Economics and Law, (4), pp. 30–37

[10] Khisamova, Z.I., Vasyukov, V.F. (2021) *Investigation and seizure of electronic media in the production of investigative actions*, Revista de Direito, Estado e Telecomunicacoes, 13(2), pp. 78–88.

[11] Khisamova, Z.I. (2017). *Ugolovnaya otvetstvennost' za prestupleniya, sovershaemye v finansovoy sfere s ispol'zovaniem informatsionno-telekommunikatsionnykh tekhnologiy* [Criminal liability for crimes committed in the financial sphere using information-telecommunication technologies]. Moscow: Yurlitinform.

[12] Kozyulin, V.B., Grant, T., Grebenshchikov, A.V., Dzhiaka, Zh., Efimov, A.R., Sun Sinpin, Wareham, M. (2016). Boevye roboty: ugrozy uchtennye ili nepredvidennye? [Killer robots: threats accounted for or unforeseen?]. *Indeks bezopasnosti*, 22(3-4), pp. 79–96.

[13] Kudryavtsev, V.N., Luneev, V.V., Naumov, A.V. (eds.) (2005). *Ugolovnoe pravo Rossii. Obshchaya chast': Uchebnik* [Criminal law of Russia. General part: tutorial]. Moscow: Yurist.

[14] Razgildiev, B.T. (ed.) (2004). *Ugolovnoe pravo Rossii: kurs lektsiy v 6 t. T. 1. Kn. 1.* [Criminal law of Russia: lecture course in 6 vol. Vol. 1. Book 1]. Saratov: Saratovskaya gosudarstvennaya akademiya prava.

[15] Saygashkin, A.N. (2006). *Ugolovno-pravovaya okhrana prav i svobod cheloveka i grazhdanina v Rossiyskoy Federatsii* [Criminal-legal protection of the rights and freedoms of a person and citizen in the Russian Federation]. Abstract of a PhD (Law) thesis. Saratov.

ABOUT THE AUTHOR

Ildar R. Begishev – Ph.D. in Law, Honored Lawyer of the Republic of Tatarstan,
Chief Researcher of the Institute of Digital Technologies and Law,
Professor, Department of Criminal Law and Procedure,
Kazan Innovative University named after V.G. Timiryasov
(Kazan, Russian Federation)
e-mail: begishev@mail.ru
ORCID ID: https://orcid.org/0000-0001-5619-4025

ABOUT THIS ARTICLE

Conflict of interests: Author declare no conflicting interests

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Research article
Journal Link: https://ijlcw.emnuvens.com.br/revista
DOI: https://doi.org/10.54934/ijlcw.v1i2.26

DNA EVIDENCE, NEW TECHNOLOGIES, AND JUSTICE'S APPLICATIONS: AN INTERNATIONAL COMPARATIVE OVERVIEW

Eugenio D'Orio
Bio Forensics Research Center, Italy
Chiara Lucanto
Bio Forensics Research Center, Italy
Genaro Francione
Bio Forensics Research Center, Italy

Article Information:

Received
October 4, 2022
Approved
October 20, 2022
Accepted
November 17, 2022
Published
December 29, 2022

Keywords:

DNA evidence,
technologies,
justice,
comparative law,
international law

ABSTRACT

Modern technologies represent an increasingly useful tool in the justice system, and their direct application affects practically every single branch of justice, from the civil trial to the criminal trial, to the computerized organization of judgments and their availability to legal practitioners, to applications of artificial intelligence (AI). In the field of criminal trials, DNA examination technologies represent an important tool for acquiring scientific information that is increasingly useful for a proper search for historical truth. These technologies, which are constantly evolving, have characterized trials and investigations all over the world since the early 2000s. However, this technical evolution is often not followed by a regulatory evolution, the purpose of which would be to assist and maximize the use of these new technologies in the justice system. This article will highlight, in a comparative manner, the current European and extra-European laws on the regulation of genetic evidence. An in-depth focus will be made both on regulatory aspects both on aspects related to the new scientific methodologies and how their use can affect human rights, with particular regard to the protection of citizens' basilar human rights.

FOR CITATION:

D'Orio, E.; Lucanto, C.; & Francione, G. (2022). DNA Evidence, New Technologies, and Justice's Applications: An International Comparative Overview. International Journal of Law in Changing World, 1 (2), 84-102. DOI: https://doi.org/10.54934/ijlcw.v1i2.26

1. INTRODUCTION

Genetic evidence in the modern justice system is the result of a far-reaching regulatory and technological development that has taken place in the last twenty years worldwide. In order to properly introduce the subject of genetic evidence, its evolution - scientific and legal - over the years and the related regulatory developments, it is necessary to divide this paper into the following sub-chapters.

2. SCIENCE IN THE CRIMINAL PROCEEDINGS: INTRODUCTION

"To judge the expert's advice the judge should know what he not only does not know, but that with the expert's call he confesses to not knowing" [1].

This is the paradox of the evaluation of scientific evidence, a paradox that has generated considerable reflection, changing doctrinal contributions and jurisprudential interventions; in the background the complicated and elusive question: how can the judge, as a non-expert, subject the expert's work to critical scrutiny? The problem of the evaluation of scientific evidence arises with increasing current, given that the evidentiary reconstruction of the fact, much more often than in the past, is entrusted to the resolution of technical-scientific questions, hence, to results that scientific evidence composes and conducts in criminal proceedings with the help of experts.

It has been observed in doctrine that a decision that is based on an expert response that is indecipherable or in any case insusceptible of review by the judge resembles dangerously resembles the ancient ordalic rites: yesterday there was divinity, today science [2].

But such a consideration undeniably suffers from a link to a concept of science understood in unitary, stable terms: an infallible science. And, thus reasoning, it would delineate scientific forensic evidence in the criminal trial. One will reflect shortly on what one may call an evolution of the positivist conception positivist conception: not a single, stable science, but several sciences, as such surmountable and therefore fallible.

More often than not, the concept of science evokes not so much what science is, but rather what derives from science: the technical-scientific discoveries, the complex advanced technologies, the fruits

https://doi.org/10.54934/ijlcw.v1i2.26

of specialized knowledge. Yet science is a process, a complex system of processing the natural world and of continuous discoveries about it: the essence of science is the scientific method [3].

Likewise, what characterizes scientific evidence, its specialized connotation, is the epistemological basis on which it bases its conclusions, founded, therefore, on statements, formulations and methods subjected to the experimental control of the scientific community scientific community of reference.

According to the most widely followed definition, scientific evidence is understood as that complex of "evidentiary operations for which, at the moments of admission, assumption and evaluation, instruments of knowledge drawn from science and technology are used, i.e. and technique, i.e. scientific principles and methodologies, technological technical apparatus whose use requires external expertise" [4].

It is frequently the laws scientific laws that constitute the prerequisite for scientific proof, as the results are

based on the application of them to the concrete case; but it is also true that what characterizes scientific evidence is not the interference of scientific laws for the purpose of its evidentiary use, but rather, the evidentiary use, but rather, the adoption of the scientific method "i.e. the method that reconstructs the event with the analytical examination [...] of all the segments of the event, arriving at its explanation with the use of the scientific method.

its explanation with the use of the inductive method that allows us to recompose the fragments of reality into a single picture' [5].

The scope of scientific evidence extends to both the field of substantive criminal law and procedural law. Substantive criminal law as well as to the field of procedural law: on the one hand, it can affect criminal cases when reference is made to specialized knowledge within it [6]; on the other hand, undoubtedly represents a useful tool for the evidentiary reconstruction of the fact at trial.

In recent times, in fact, we have witnessed an increasingly intense and massive use of science in criminal proceedings; on the other hand side, it is undeniable how fundamental and productive the contribution of scientific knowledge is to justice by means of useful, sometimes indispensable, for the reconstruction of the fact; achieving, the scientific evidence an almost undisputed privileged claim over other findings (G.Sprangher, 2011): "a kind of scientistic primacy scientism [that] tends to oust both

https://doi.org/10.54934/ijlcw.v1i2.26

declarative evidence and the maxims of experience as its instruments of evaluation, from the central position they tradition and in the trial-criminalist imaginary of an accusatory matrix [6]".

There is no lack, however, of doctrinal voices of relative criticism towards a spasmodic and and unconditional use of science in the procedural field [9], also taking into account the difficulty related to the very nature of science, i.e. what is both the foundation and together a limitation to the proper use of scientific evidence in criminal proceedings: science is not infallible, it is continually surmountable, not therefore capable of providing an immutable method of knowledge, because scientific results can as such be disproved.

3. FORENSIC GENETIC ANALYSIS: TECHNOLOGICAL AND METHODOLOGICAL DEVELOPMENTS

Forensic genetics, as well as forensic biology, is a branch of forensic science and therefore deals with individual identification from the analysis of biological traces, but unlike forensic biology, it finds its beginning and end within specialized laboratories.

The fields of application of this subject are multiple such as:

• Criminal cases: suspect/victim-trace

• Paternity testing: controversial paternity

• Immigration: family relationships

• Identification: mass disaster (DVI), missing persons, historical identifications

Throughout history the techniques and obviously the knowledge of forensic genetics has been modified and increased. In 1900 there was the discovery of the first genetic polymorphisms, AB0 blood groups, by Landsteiner15, and in 1915 the first tests, based on antibodies, were performed for blood groups. In 1910 Locard stated the principle that "every contact leaves a trace" revolutionized the method of operation in the field of forensic science [10]. Between 1920 and 1950, other blood groups and serum proteins were discovered and used. In 1953, the discovery of the double helix structure of DNA allowed the beginning of forensic genetics research at the molecular level [11]. In 1960, British geneticist Alec

https://doi.org/10.54934/ijlcw.v1i2.26

Jeffreys developed the technique of multilocus DNA fingerprinting which led in 1986 to the first use of DNA in criminalistics.

Jeffreys discovered some hypervariable regions in human DNA, called variable number of tandem repeats (VNTR) minisatellite regions, which are dispersed throughout the human genome and are tandem repeat regions. The variability is due to the fact that many of the minisatellite regions are highly polymorphic due to allelic variation. A probe based on this tandem repeat of the core sequence can detect many highly variable loci at the same time, and with this technology it is possible to provide a specific fingerprint of individual DNA [12].

The technique developed by Jeffrey required first the extraction of DNA and then the use of restriction enzymes. Each enzyme cuts the DNA molecule at a precise site composed of repeated nucleotide sequences. After that, electrophoretic running on agarose gels of DNA molecules appropriately hybridized with probes for polymorphic loci was carried out. In this way and depending on the number and position of the different restriction sites we can have fragments of shorter or longer length. A large fragment will run slower than a small fragment, depending on the molecular weight. The result was a series of black bands on the X-ray film [13].

Although this technique was completely revolutionary in the forensic field, it had limitations. For an efficient VNTR analysis to take place, since they present repeated sequences composed of up to 20 nucleotides, it is essential that a relatively large amount of DNA is available. This condition makes the technique inefficient when samples with degraded DNA are analysed and the analysis took a long time to complete [14]. These limitations have only been overcome with the development of Polymerase chain reaction (PCR); a technique that allows multiple copies of a specific DNA sequence to be obtained in a short period of time (K.Mullis, 1993). In addition, fluorescent probes have supplanted radioactive probes and capillary electrophoresis has taken the place of the agarose gel; these are the major changes Jeffreys' technology has undergone [15].

With the discovery of the polymerase chain reaction (PCR) technique, a new generation of DNA markers were identified, such as microsatellites (STR), single nucleotide polymorphism (SNP) and mitochondrial DNA (mtDNA).

Currently, the most widely used genetic markers in forensics are microsatellites short tandem repeat (STR), which are polymorphic sequences in the population. STRs have polymorphisms of different

https://doi.org/10.54934/ijlcw.v1i2.26

lengths, so there are no changes in the nucleotide sequence, but in the number of repeats of a sequence within the microsatellite. STRs are composed of repeat motifs (2-6 bp) resulting in shorter overall length fragments (<500 bp) that could also be detected in degraded (i.e. highly fragmented) DNA, which is often present in forensically relevant samples [16]; they can be classified according to the number of bases present in the repetitive unit: dinucleotide, trinucleotide, tetranucleotide, pentanucleotide, and hexanucleotide sequences.

Microsatellites, in the forensic community usually referred to short tandem repeats, especially sequences defined as tetranucleotide have demonstrated to be ideal for forensic applications [17]. STR typing is more sensitive than single locus restriction fragment length polymorphism (RFLP) methods and less susceptible to allelic dropout than VNTR (variable number of tandem repeats) systems [18].

In 1990, the FBI began a test DNA databasing program with 14 state and local laboratories. ("Combined DNA Index System (CODIS)". On October 13, 1998, the Federal Bureau of Investigation (FBI) officially introduced its nationwide DNA database. As early as 2006, this database, called the COmbined offenders DNA Index System or CODIS, contained over 5 million STR profiles and linked all 50 states in the United States with the ability to search for criminal DNA profiles [19].

Marker characterization was completed in November 1997 with the selection of 13 loci: CSF1P0, FGA, TH01, TPOX, VWA, D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51, and D21S11 (J.M.Butler, 2006). In 2009, the European Network of Forensic Science Institutes (ENFSI) and the European DNA Profiling Group (EDNAP) selected 17 STR loci that define the European Standard Set (ESS). The selected loci, partly shared with CODIS, are: D1S1656, D2S441, D2S1338, D3S1358, FGA, SE33, D8S1179, D10S1248, TH01, vWA, D12S391, D16S539, D18S51, D19S433, D21S11, D22S1045, and amelogenin (L.Welch, 2012).

Forensic DNA database technology is divided into three parts: (1) the collection of known samples, (2) the analysis of these samples and entering their DNA profiles into a computer database, and (3) the subsequent comparison of the unknown profiles obtained from crime scene evidence with the known profiles in the computer database.

One of the greatest challenges in maintaining a DNA database is the issue of privacy and security of the information stored in the database. Blood samples contain genetic information that could be used against an individual or their family if not handled properly. The issue of privacy is approached in two

https://doi.org/10.54934/ijlcw.v1i2.26

ways. First, the DNA markers, the 13 STR loci in CODIS, are in non-coding regions of DNA and are not known to have any association with a genetic disease or any other genetic predisposition. Second, no names of individuals or other characterizing data are stored with the DNA profiles. Case-specific data are protected and controlled by local law enforcement agencies. Thus, only the crime lab that submitted the DNA profile could link the DNA results to a known individual. Another important aspect to the privacy and security of information in DNA databases is the fact that access to CODIS is for law enforcement purposes only.

Currently, there are kits on the market that allow simultaneous amplification of multiple markers: there are reliable and validated commercial kits that allow amplification of 24 STRs, including both CODIS (Combined DNA Index System) and European Standard Set (ESS) markers.

A typical STR typing kit consists of the following five components: (1) a mixture of PCR primers containing oligonucleotides designed to amplify a set of STR loci (one primer pair islabelled with a fluorescent dye); (2) PCR buffer; (3) DNA polymerase; (4) an allelic ladder with common alleles for the STR loci to be amplified to allow calibration of the allelic repeat size; and (5) positive control DNA sample to verify that the kit reagent is working properly.

The first step in forensic DNA analysis is sample collection and sample preservation. The next step is DNA extraction followed by DNA quantification. We proceed with PCR, in general it is a multiplex PCR amplification, then we need to separate and size the alleles with STR typing by capillary electrophoresis. At the end, we have interpretation of the result for comparison with the reference sample, or for DNA database search. If we have a match, we need a comparison between the DNA profile and the allele frequency of the population, to generate a case report with a value, which means the probability of a random match with an unrelated individual. This is a critical information, so a statistical evaluation is the most important aspect, because with the statistical evaluation we can understand if our profile is rare or a common profile, in general these regions are so variable that it is almost impossible to find 2 individuals with the same profile, but we always need the statistical evaluation, we need numbers to explain the meaning of genetic compatibility. So, in every relationship we need genetic compatibility plus a number to explain the value of this compatibility (P.Schmitt-Kopplin, 2008). STR analysis, however, does not bring good quality results when forensic biological samples contain too little template DNA or are too degraded [20].

https://doi.org/10.54934/ijlcw.v1i2.26

One class of genetic markers that may prove useful, particularly when we are in low template conditions, or degraded samples, are SNPs [21]. Single nucleotide polymorphism refers to a change of a single base in a DNA sequence. SNPs are commonly biallelic. Precisely because of this characteristic, SNPs are less informative in identity testing than STRs. In fact, many more SNPs are required to achieve the same level of discrimination achieved by the 13 STR loci [22]. However, the use of SNPs is very useful for obtaining information about the phenotypic traits of a person who has left their biological material at the crime scene. An example isthe commercial kit IRIS Plex for accurate prediction of blue and brown eye colour of an individual, starting from a sample on the crime scene.

Applying IRIS-PLEX we can combine all the information of eyes (3 categories: blue, intermediate, and brown), skin (5 categories: very light, light, intermediate, dark, very dark) or hair (4 categories: red, blond, brown, and black) colours, to obtain a sort of identikit, to associate for example with a STR profile [23].

Lineage markers have special applications in forensic genetics. Set out the analyses of the Y chromosome it is possible to have a lot of information, especially in cases where there is an excess of DNA from a female victim and only a low percentage from a male perpetrator.

This condition is very frequent in cases of evidence that have mixed profiles involving more than two male subjects (the analysis allows to determine the number of such subjects) and in cases of heterosexual sexual violence (the DNA of the perpetrator is not subject to contamination by the DNA of the victim). However, the analysis of STR on the Y chromosome have limitations, first of all that being transmitted only from father to son, male relatives all have the same Y profile [24].

Furthermore, a genetic profile can be obtained not only from nuclear DNA but also from mitochondrial DNA especially in cases of analysis of low-level nuclear DNA samples, particularly from unidentified (typically skeletonized) remains, rootless hair shafts, or very old specimens where only highly degraded DNA is available (R.Loewer, 2013).

Mitochondrial DNA is present in multiple copies per cell unlike nuclear DNA. It is inherited exclusively from the mother and is a single circular chromosome only 16kb long (contains 16,569 bp), coding for 37 genes. It contains 22 genes that encode tRNAs and 2 rRNAs. It also encodes 13 proteins that are subunits of oxidative phosphorylation. It contains only exons, no introns, and has no repair system, leading to high mutation rates in the D-loop [25].

https://doi.org/10.54934/ijlcw.v1i2.26

4. INTERNATIONAL COMPARATIVE LAWS: FROM THE FRYE'S STANDARD TO THE DAUBERT'S CRITERIA

The US judicial experience, initially timid and not very open to new scenarios and new resources of science and technology, sees its most important rethinking in the transition from the leading Frye case of 192327 - which established the criterion of General Acceptance, centred on the appeal to the general and shared consensus of the scientific community - to the Daubert case of 199328.

In the famous Frye pronouncement, it is stated: "[the scientific principle or discovery on which on which] the [evidential] inference rests must be sufficiently well established to have received general acceptance in the particular field to which it belongs" [26].

In other words, the lack of acceptance by the reference community of the validation of a hypothesis, means scientific uncertainty, therefore a proof can be accepted only insofar as it is based on a scientific principle or discovery sufficiently stable to be generally accepted in the field of research to which it relates.

The ruling states, first of all, that the court, when faced with elaborating of innovative theories or in scientifically controversial situations, is called upon to assess the relevance of the evidence with reference to the case at hand, being otherwise inadmissible; having carried out this preliminary verification, it will be called upon to assess whether or not a given thesis has achieved a high level of consensus in the relevant scientific field.

The Frye standard, centered on majority opinion, however, left unresolved a number of problems.

The criterion, in addition to seeing a judge subservient to the more or less established theories scientific theories, and thus subservient to the assessments offered by the expert community; was preclusive to the entry into the trial of new scientific evidence generated by technological progress; as well as reductive for all those areas in which the boundary between good or bad science appears difficult to trace even within the scientific community itself.

As has been correctly pointed out, the Frye standard - by claiming only the evidentiary criterion of general acceptance by the community of the criterion proposed by the expert - does not take into account the existence of intermediate disciplines between exact sciences and pseudosciences, "i.e. disciplines in

https://doi.org/10.54934/ijlcw.v1i2.26

which, for the same specific problem: there are several competing criteria of judgement (e.g. psychiatry, economics); there is a criterion, yes, a single one but with a broad rather than general consensus (e.g. oncology, toxicology); there is a criterion, yes, unique, but newly discovered and therefore shared by a very limited number of experts (e.g. genetics, toxicology) [26].

The Frye test therefore generated problems in identifying the scientific community of reference for all those scientific tests that embrace multidisciplinary fields, not allowing a full understanding of when a generalised consensus can be said to be reached or not reached a generalized consensus.

Moreover, referring to the sole parameter of general acceptance, could make sense only if science represented a granitic and unchangeable entity, and was not, as in fact it is, in continuous movement and overcoming.

Some seventy years later, that single criterion of admissibility of scientific evidence is therefore expanded and reconstructed in an ancillary key with respect to the other parameters set out in the famous Daubert v. Merrel Dow Pharmaceuticals, Inc.

This judgement has undoubtedly increased the role of the judge in the matter of the admission of admission of evidence, taking into account that the US trial process assigns to the judge the task of deciding, in an adversarial process between the parties and in the absence of the jury, whether evidence may be admitted, based on direct review of the reliability of the scientific instrument.

In attempting to provide guidelines to bring clarity to the, at times, unclear blurred boundary between science and pseudo-science, the Daubert judgment takes note that the sole criterion of the majority opinion of the scientific world causes an impasse in the system; consequently, the scientific solution must be admitted which, in addition to adopt generally accepted and recognized methodologies, is or can be verified, and thus falsified, by providing control standards and indicating possible margins of error.

The Court, based on the premise that it is methodology that distinguishes science from other fields of human enquiry, argues that in the judgement of admissibility one must take certain aspects into account, namely: Verifiability of the method. The first characteristic that scientific knowledge must possess is that of verifiability: a theory is scientific if it can be checked by means of experiments. Falsifiability, the second criterion, requires that the scientific theory be subjected to attempts at falsification. Submission to the control of the scientific community is the third criterion, in it, the method is required to be published in

https://doi.org/10.54934/ijlcw.v1i2.26

journals to be scrutinized by the scientific community. Knowledge of the rate of error is the fourth criterion. The judge must be made aware, for each proposed method, of the percentage of ascertained or potential error. The presence of constant verification standards and general acceptance of the method, means that the judge must take into account, as an auxiliary criterion, whether the method proposed enjoys general acceptance by the expert community. It is worth to specify, in relation to this last criterion, that the general acceptance of the methodology within the scientific community enjoys an entirely different reading from that proper to the Frye test: it remains a criterion to be considered, albeit neither necessary nor exclusive.

In other words, it is stated that in order to be admissible, scientific evidence must be examined not only on the basis of the explicit requirement of evidentiary relevance, but also on the basis of the requirement of the 'reliability' of expert testimony, reliability assessed not exclusively by that one criterion set out in the case Frye.

As to relevance, the Court states that scientific evidence, insofar can be helpful in resolving a dispute of fact, insofar as the expert's theory is sufficiently related to the facts of the case: the scientific method, or the technology to be intended to be used must have an adequate connection with the individual fact to be proved, such that which it is not sufficient that the principle or method is valid, but it must also be useful for the purpose of reconstructing the fact in the individual case.

The validity of the scientific principle on which the theory rests requires for it to be so that it is based on scientific knowledge that as such is supported by valid scientific arguments and foundations, and are not rather fruit of speculation devoid of any corroboration or of personal convictions of the expert disassociated from data.

A suitability for ascertaining the concrete fact that is, therefore, inextricably linked to the reliability of the method itself: it would, moreover, be pointless and unnecessary to question the admissibility of technical-scientific resources if these, however, would not bring usable results within the process.

Both the Daubert case and the subsequent case law interventions that have led in the US trial to the amendment of Rule 702 with consequent adaptation of the rules to these selective criteria in the field of expert testimony, tend to to prevent unverifiable and unscientifically grounded material from enter the trial and frustrate or distort the trial ascertainment. It remains that - we repeat - they are essentially aimed at the admission phase, since in the US adversary system, the actual role of 'trier of fact' is left to the jury.

https://doi.org/10.54934/ijlcw.v1i2.26

The criteria of the Daubert judgment have undoubtedly influenced the Italian experience, to the extent that they are considered to have been transposed into Italian law even by the most recent case law.

How the adjudicating body can perform this critical mediation, and thus how to approach with such criteria, in the light of which the critical scrutiny can be said to be exhausted, will be the subject of further reflection.

But one must first ask oneself what is the place in which to carry out this operation, i.e. the level at which the judge implements this filter.

Jurisprudential contributions on this point are mostly projected to the final stage of the evaluation of scientific evidence, failing to consider the usefulness that an approach tending to isolate and deal with the individual phases of the evidentiary process is able to offer.

On the other hand, the misunderstanding of providing a reflection on scientific evidence addressed solely from an evaluative point of view, one would obtain a reflection that is devoid of the logical-procedural path that scientific evidence, like all evidence, takes in the stages preceding phases.

It is therefore necessary to highlight the close dialectical connection between the phases that characterize the evidentiary procedure, from admission to the formation of the material, following the rational logical-procedural development, the former being – the admission and acquisition - serving the orderly and proper unfolding of the later: the problem of the evaluation of scientific evidence can only be first the problem of its admission and acquisition.

Solving the paradox of the evaluation of scientific evidence will mean first resolve when and how scientific evidence will be respectively admitted and acquired respectively.

5. POPPER'S THEORY AND THE SCIENTIFIC PROCEEDINGS

"What are the remedies for a truly fair new justice?"

In this period some striking judicial cases (e.g. Meredith Kercher, Melania Rea, Elena Ceste, Guerina Piscaglia, Roberta Ragusa, Yara Gambirasio, Sara Scazzi, Chiara Poggi etc.) have brought to the limelight the suspects who continue, although arrested, to proclaim their innocence. The deficiency of certain evidence and the founding of processes on purely clues have generated on the network and Face

https://doi.org/10.54934/ijlcw.v1i2.26

Book opposing groups of innocents and guilty parties. A real cult where everybody becomes judges, criminologists, experts, stimulated by press and especially television media that dedicate 70% of their programming to the to the criminal show.

The first investigation that must be carried out by a fair judge in the search for a procedural truth is that on the method used and on its effectiveness. Here modern epistemology, in particular the philosophy of Karl Popper, helps us.

In science, conjectures based on clues are valid to create a scientific thesis but this must be submitted to the scientists to experiment in the laboratory. The thesis is valid only if all the scientists reach the same conclusion. Mutatis mutandis the procedure also applies to judges. If a conjecture leads to different results on the part of the analyzers, then that conjecture is fallacious or at least it is not known to what extent it is true.

The judge in the analysis of the evidence must merge with the traditional criterion of verification, based on the search for data confirming the incriminatory conjecture, the most modern devised by Popper in the epistemology of falsification, i.e., going to research, even beyond the evidence sometimes, facts that could contradict the main statement. "The criterion of falsifiability maintains that an assertion, to be empirically informative, that is to say scientific, must be falsified principally and not denied in fact, despite the most severe attempts to make it fall".

We must abandon the lethalness principle of the "free conviction of the judge". It is necessary, therefore, that the magistracy models a new scientific methodology, avoiding confusion as it has sometimes happened in the past. Only by distinguishing legal science as a conjecture (based on clues) and legal science as a result, based only on strong evidence of proofs, can we have a real guarantee of a criminal justice free from prejudice and truly egalitarian.

Using these principles, Mr. Gennaro Francione, Judge of the Criminal Court of Rome, Italy, has raised, in vain the question of unconstitutionality of the process based on the clues but the Constitutional Court with Ordinance no. 302 of 2001 rejected my request in a brusque way. A noted journalist, Gigi Trilemma, wrote in his article "The Constitutional Court has lost an opportunity to abandon permanently the literary processes and give definitive space to the scientific process based on certain evidence and not on clues. I am sorry the hasty system with which the Constitutional Court has solved the epistemological question, avoiding tackling the crucial matter about the so-called war on the proof versus the clues. The

https://doi.org/10.54934/ijlcw.v1i2.26

criminal judge, on the other hand, demanded just to do this, that is to decide not with the tautological criteria of legal formalism but based on the principles of modern epistemology, which can only define what is certain and what is false in any proceedings to collect evidence on facts".

The trials are made for strong proof not for clues that only serve to create conjectures, invalidated if no evidence is found. This is the popperian scientific process, not a mediaeval novel. The clues only serve to open investigative tracks but then if there is no strong evidence the process fails. A thousand clues do not form a single proof, not like 1000 rabbits which form a warren and certainly not a lion!

Discovering the authors of the crimes is anything but simple. Detective stories say that no crime is perfect. Indeed, perfect crime does exist! A big number! And justice enjoys finding culprits at all costs to show that it works.

To limit the judicial freedom of the judges in a scientific way, together with the late professor Imposimato we came up with a list of legal evidence to be followed. In this regard the judges must demand not only confession and / or smoking pistol, but also unequivocal telephone tapping, crisscrossed testimonies, reconstructed paths with CCTV cameras, post delictum markings with bugs, applications antistalking as Mytutela, scientific surveys done properly and 100% safe. Certainly not as in the cases Cogne, Melania Rea, Meredith, Bossetti. Not to mention the case of Elena Ceste where you do not even know how the woman died, or Guerina Piscaglia and Roberta Ragusa whose bodies were not even found not knowing if they died or not, if they were killed and how and by whom. If you do not go through strong proofs, all you can do is trigger indictment trials against alleged perpetrators, keeping them out of jail anyway. If then the clues do not lead to proof, serious, precise and concordant, the process has failed.

Nowadays trial based on clues is required by law but it is irrational because in itself it always creates reasonable doubt so much so that these striking cases create the faction of the guilty and that of the innocentists, thus lacking upstream certainly of the final verdict. We continue to fight to make the declaration process unconstitutional. Also, because against the expression of the norm what was supposed to be an exceptional process has become the rule by putting the weaker subject in jail and setting him up as a scapegoat. According to statistics, 90% of the processes today on a clue basis would be wiped out, remaining only 10% of processes to be carried out until the possible sentence. A quick but right way to dispose of the backlog.

https://doi.org/10.54934/ijlcw.v1i2.26

We use DNA as a model of study, which is even considered in some striking processes (Bossetti case) as a proof, being, instead, a simple clue. Both the facts of the media and the positions of various "insiders" show us that the genetic test is not infallible as is believed. With the rigorous Popperian method, the first notation is that DNA sampling and analysis must be guaranteed by the creation de iure condendo of a national sampling service and investigations with super parties experts, depending on the magistracy (we believe to exhume the investigating judge) and not of the Public Minister. At the time those delicate acts of investigation must be guaranteed by the presence of a defense counselor also for the unknown murderer otherwise all is nil (article 111 of the Constitution). It is necessary to provide a legal defender and a legal advisor for the unknown to avoid the formal flaw of the control and verification procedure. It is not pure theory given the problems created by the scientific police in the Meredith Kercher case, which ended with the acquittal of Amanda Knox and Raffaele Sollecito.

Besides the criterion of detector neutrality it is necessary to guarantee a supervisor in the key stages of the collection of exhibits, the correct chain of custody, the laboratory analysis to ensure the right assumption (procedures, instruments, etc.), conservation and analysis of data.

The currently dominant static criminology is Aristotelian, apodictic and is aligned with the clue process. The dogmatic omnipotence of DNA is part of it.

Dynamic criminology, on the other hand, requires a rigorous answer to the questions: "Quis quid ubi quibus auxiliis cur quomodo". This is of corse a latin phrase, which literally means "who, what, where, by what means, why, how, when?". It is an hexameter elaborated by Cicero (quoted by St. Thomas Aquinas) which contains the criteria to be observed in the conduct of a literary composition: to consider the person acting (quis); the action, what he does (quid); the place where it happens (ubi); the means that he uses in executing it (quibus auxiliis); the purpose it has (cur); the way it's done (quomodo); the time it takes him to execute it (when) [28].

So, we use the brocardo with the addition of the "quantum" to implement the reconstructive sequence of a crime in a criminal key.

And therefore, we have built a complete sequence of a crime in terms of dynamic criminology, strict response to every single question in verification and falsification of data according to the teachings of Popper.

https://doi.org/10.54934/ijlcw.v1i2.26

The scheme described above in the Bossetti case admitted and not granted that the DNA is his. This element is not enough to attribute the crime to him. It is necessary to establish precisely "how", but it must be considered that with the possible homicidal action, it cannot rule out accidental or artful contamination. It's possible that the suspect has left traces not because he's the murderer himself but because he has touched the corpse post delictum accidentally or to conceal the dead body.

Before wrapping up, the fair trials are done by science and strong proofs. Certainly not by fictional clues [29].

6. CONCLUSIONS

In accordance with the above-mentioned issues, scientific publications and legal rulings and guidelines, it is evident that the international scientific and legal community is very attentive to the subject of scientific evidence. However, it is equally evident that, nowadays, very different orientations and approaches on this issue continue to exist in different nations. This certainly represents a major limitation in the justice system; in fact, the existence of different standards and/or different legal orientations, in practice, conflict with an objective application of scientific data in trials. In addition, these divergences also have an important impact in terms of guaranteeing the fundamental rights of citizens, as they will have different possibilities - depending on the country in which they find themselves - to make use of scientific evidence in order to protect their legal position and/or legitimate interests. This study aims to offer a comparative view of scientific evidence precisely in order to highlight the merits and shortcomings of an international legal system that must necessarily evolve both in terms of the rules of law and in terms of access to modern technologies precisely in order to effectively guarantee citizens' rights and the holding of a fair trial.

REFERENCES

[1] F. Carnellutti, 1956, *Principi del processo penale*, Napoli, Italy

[2] F. Focardi, 2003, *La consulenza tecnica extraperitale*, Padova, Italy

[3] D. Goodstein, 2011, How Science work, in Reference Manual on Scientific Evidence: Third Edition, 37 www.nap.edu/13163

https://doi.org/10.54934/ijlcw.v1i2.26

[4] O. Dominioni, 2005, *La prova penale scientifica. Gli strumenti scientifico-tecnici nuovi o controversi e di elevata specializzazione*, Milano, Italy

[5] C. Brusco, 2008, *La valutazione della prova scientifica*, in Aa. Vv., La prova scientifica nel processo penale, cit., 38

[6] F. Giunta, 2015, *Questioni scientifiche e prova scientifica tra categorie sostanziali e regole di giudizio, in Prova scientifica, ragionamento probatorio e decisione giudiziale*, M. BERTOLINO – G UBERTIS, Napoli, Italy

[7] G. Spangher, 2011, *Brevi riflessioni, sparse, in tema di prova scientifica, in Scienza e processo penale. Nuove frontiere e vecchi pregiudizi*, C. CONTI, Milano, Italy

[8] F. Giunta, 2018, *Questioni scientifiche e prova scientifica tra categorie sostanziali e regole di giudizio, in Prova scientifica, ragionamento probatorio e decisione giudiziale*, Discrimen, Italy, https://discrimen.it/questioni-scientifiche-e-prova-scientifica-tra-categoria-sostanziale-e-regole-di-giudizio/

[9] E. Amodio, 2007, *Il diritto delle prove penali nel pensiero di Mirjan Damaska*, in Riv. It. dir. e proc. pen. Italy

[10] R. W. Byard, H. James, and J. Berketa, 2016, *Locard's Principle of Exchange, Dental Examination and Fragments of Skin.* Heath KJ, Forensic Sci.

[11] D. E. Reich, S. F. Schaffner, M. J. Daly, G. McVean, J. C. Mullikin, J. M. Higgins, D. J. Richter, E. S. Lander, and D. Altshuler, 2002, *Human genome sequence variation and the influence of gene history, mutation and recombination*. Nature Genetics, https://pubmed.ncbi.nlm.nih.gov/12161752/

[12] A. Jeffreys, V. Wilson, and S. Thein, 1985, *Hypervariable 'minisatellite' regions in human DNA.* Nature 314, 67-73.

[13] P. Gill, A. J. Jeffreys, and D. J. Werrett, 1985, *Forensic application of DNA 'fingerprints'*. Nature, 318, 577-579.

[14] W. Goodwin, A. Linacre, and S. Hadi, 2007, *An introduction to Forensic Genetics* (New Jersey: John Wiley & Sons, Limited)

[15] L. Roewer, 2013, *DNA fingerprinting in forensics: past, present, future*, Investigative Genetics – Nature, https://pubmed.ncbi.nlm.nih.gov/24245688/

[16] W. Parson, 2018, *Age Estimation with DNA: From Forensic DNA Fingerprinting to Forensic (Epi) Genomics: A Mini-Review. Gerontology.* Nature: Gerontology, https://pubmed.ncbi.nlm.nih.gov/29393215/

[17] A. Carracedo, (Ed.), 2005, *Forensic DNA typing protocols*, (Berlin: Springer Science & Business Media)

[18] B. Budowle, R. Chakraborty, A. M. Giusti, A. J. Eisenberg, and R. C. Allen, 1991: *Analysis of the VNTR locus D1S80 by the PCR followed by high-resolution PAGE*. Am J Hum Genet.

[19] FBI's Combined DNA Index System (CODIS) Homepage; www.fbi.gov/hq/lab/codis/index1.htm

[20] B. Budowle, and A. van Daal, 2008, *Forensically relevant SNP classes*, Biotechniques, https://pubmed.ncbi.nlm.nih.gov/18474034/

https://doi.org/10.54934/ijlcw.v1i2.26

[21] P. Gill, D.J. Werrett, B. Budowle, and R. Guerrieri, 2004, *An assessment of whether SNPs will replace STRs in national DNA databases* – joint considerations of the DNA Working Group of the European Network of Forensic Science Institutes (ENFSI) and the Scientific Working Group on DNA Analysis Methods (SWGDAM). Sci. Justice

[22] R. Chakraborty, D.N. Stivers, B. Su, Y. Zhong, and B. Budowle, 1999, *The utility of STR loci beyond human identification: implications for the development of new DNA typing systems,* https://pubmed.ncbi.nlm.nih.gov/10435432/

[23] P. M. Schneider, B. Prainsack, and M. Kayser, 2019 *The use of forensic DNA phenotyping in predicting appearance and biogeographic ancestry.* Dtsch Arztebl Int

[24] L. Gefrides, and K. Welch, 2010, *Forensic Biology: Serology and DNA. The Forensic Laboratory Handbook Procedures and Practice*, https://www.academia.edu/35960415/Forensic_Biology_Serology_and_DNA

[25] C. Yan, X. Duanmu, L. Zeng, B. Liu, and Z. Song, 2019, *Mitochondrial DNA: Distribution, mutations, and deletion*. Cells. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6523345/

[26] G. Carlizzi, 2017, *Giudice 2.0 e uso del sapere specialistico nel processo penale*, in www.processopenaleegiustizia.it

[27] In base all'art. 401 delle Federal Rules of Evidence statunitensi «evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable than it would be without the evidence»

[28] G.Francione, and E.D'Orio, 2019, *Criminologia Dinamica. La via di Popper al DNA*, Nuove Editrice Universitaria, Italy

[29] G.Francione et all, 2021, *La tavola delle prove legali*, Nuova Editrice Universitaria, Italy

https://doi.org/10.54934/ijlcw.v1i2.26

ABOUT THE AUTHOR

Eugenio D'Orio – Bio Forensics Research Center, Italy
e-mail: eugenio.dorio@bioforensics.it
ORCID ID: https://orcid.org/0000-0001-7861-3243

Chiara Lucanto – Bio Forensics Research Center, Italy

Genaro Francione – Bio Forensics Research Center, Italy

ABOUT THIS ARTICLE

Conflict of interests: Authors declare no conflicting interests

International Journal of Law in Changing World

Volume 1 Issue 2 (2022) ISSN 2764-6068

Book Review
Journal Link: https://ijlcw.emnuvens.com.br/revista
DOI: https://doi.org/10.54934/ijlcw.v1i2.21

THE SHANGHAI COOPERATION ORGANIZATION: EXPLORING NEW HORIZONS: A REVIEW

Saslina Kamaruddin
Sultan Idris Education University, Perak, Malaysia
Muhammad Izwan Ikhsan
Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus, Malaysia

Article Information:

Received
September 3, 2022
Approved
October 17, 2022
Accepted
November 18, 2022
Published
December 29, 2022

Keywords:

book review,

ABSTRACT

The Shanghai Cooperation Organization (SCO) is a significant international gathering. The SCO, which was founded in June 2001, has grown to become the world's largest and most populous regional cooperation organisation, encompassing three-fifths of the Eurasian continent. The Shanghai Cooperation Organization (SCO) book reflects and demonstrates the SCO's mission as a political, economic, and security entity in Eurasia. The book's goal and structure demonstrate that SCO topics are explored dynamically: what the SCO was when it was created, what it is now and how it works, and what its future potentials are. The book compares the SCO's initial and current levels of interaction and cooperation and suggests new goals and tasks. Prospects and frontiers have been explored because of such an examination. SCO is distinguished from Eurocentric regionalism in the books. One of the most interesting among newly presented in volume of literature is the book "**The Shanghai Cooperation Organization: Exploring New Horizons"** published in May 2022 by Routledge (edited by Sergey Marochkin and Yury Bezborodov).

FOR CITATION:

Kamaruddin, S.; & Ikhsan, M. I. (2022). The Shanghai Cooperation Organization: Exploring New Horizons: A Review. International Journal of Law in Changing World, 1 (2), 103-107. DOI: https://doi.org/10.54934/ijlcw.v1i2.21

1. REVIEW

The Shanghai Cooperation Organization (SCO) is a significant international gathering. The SCO, which was founded in June 2001, has grown to become the world's largest and most populous regional cooperation organisation, encompassing three-fifths of the Eurasian continent. The Shanghai Cooperation Organization (SCO) book reflects and demonstrates the SCO's mission as a political, economic, and security entity in Eurasia. The book's goal and structure demonstrate that SCO topics are explored dynamically: what the SCO was when it was created, what it is now and how it works, and what its future potentials are. The book compares the SCO's initial and current levels of interaction and cooperation and suggests new goals and tasks. Prospects and frontiers have been explored because of such an examination. SCO is distinguished from Eurocentric regionalism in the books. One of the most interesting among newly presented in volume of literature is the book "**The Shanghai Cooperation Organization: Exploring New Horizons"** published in May 2022 by Routledge (edited by Sergey Marochkin and Yury Bezborodov). A comparative legal study, comparative regionalism, a comparative historical approach, social science methodologies, a multidisciplinary approach, legal analysis, empirical observation, statistical and economic data, and expert assessments have been used for the research of multinational authorship appeared in this book. The authors have also examined the range of SCO states, studied the Organization's legal opportunities and deficiencies. The studies are focused on the bloc's economic, humanitarian, legal, trade, labour, migratory, and environmental cooperation opportunities, as well as its security and defence problems

There are three sections in this book. The first, "Building a Basis: Roots and Grounds," provides an overview of the Organization's initial foundations and characteristics. The authors also assess these foundations in terms of development and prospects. Chapter 2 discusses the SCO's organizational and legal foundations, its institutional development over the past 20 years, and whether the current structure and core values ensure future growth. In Chapter 3, the authors examine the SCO's international legal framework, highlight new forms and methods of cooperation, and argue for its declaratory nature. The fourth chapter seeks SCO and security cooperation. The authors investigate the process of shifting the SCO's security agenda from conventional to non-military issues and conclude that the "Asian" model of regional security is increasingly being adopted in the "Greater Asian" environment. Chapter 5 provides a comprehensive and critical international legal analysis of the normative and conceptual framework, as

https://doi.org/10.54934/ijlcw.v1i2.21

well as SCO mechanisms, in combating extremism to obtain scientifically based new knowledge on the subject, thereby contributing to the development of effective global, regional, and national coordination.

Part II, "Moving Through the Levels of Cooperation," investigates some promising areas of organisational development. Human rights focus on Chapter 6, which examines the likely convergence of legal values and attitudes in SCO countries and Western Europe. The authors advocate the Eurasian concept of human rights to broaden horizons and balance human societies. The seventh chapter focuses on SCO humanitarian cooperation. The study identifies the primary barriers to humanitarian collaboration, intercultural dialogue, and educational space development. Chapter 8 discusses the SCO countries' labour policies and their potential for convergence as a new world order. Discover the rationale for expanding commercial ties and, eventually, legal harmonisation. Discover the rationale for expanding commercial ties and, eventually, legal harmonisation. Chapter 9 investigates labour migration among SCO member countries. The SCO is not currently focusing on migrants' social and labour rights. This chapter identifies key challenges and demonstrates how to strengthen collaboration. The goal of Chapter 10 is to identify the most promising areas of collaboration between the SCO and the EAEU to learn how to expand and strengthen their engagement.

Part III of the book focuses on new prospects and horizons, highlighting untapped SCO prospects and new crossroads. The primary goal is to strengthen economic cooperation. The economic requirements for SCO economies to grow are examined in Chapter 11. It identifies factors impeding interregional trade and economic cooperation. The authors investigate economic interaction priorities as well as legal and regulatory evolution. The discussion of energy cooperation continues in Chapter 12. The SCO has promoted it successfully. However, the SCO's energy cooperation faces challenges. Legal methods are being considered for strengthening. The authors discuss the economic cooperation of SCO countries in constructing new transportation and communication channels in Chapter 13. According to them, integrating the EAEU and SREB on the SCO platform could result in a new economic cooperation model in the "Russia-China-CA" triangle. The 14th chapter discusses India's SCO membership options. The authors argue that re-contextualizing the Organization could hasten regional economic development by bringing in new partners. Concerns are examined by looking at the region's economy. The final chapter investigates the prospects and opportunities for environmental cooperation. This shift in SCO collaboration began only recently. Prospects are discussed relatively to the importance of preventing

https://doi.org/10.54934/ijlcw.v1i2.21

climate change, maintaining the ecological balance in the SCO space, and restoring biodiversity for future generations, thereby creating favourable conditions for sustainable development.

Throughout the reading, every chapter of the book shows challenges in the respective field, poses conclusions, and suggests new cooperation prospects. Generally, the book provides a valuable and absorbing window into the Shanghai Cooperation Organization (SCO), one of the fastest-growing multipolar centres, covering China, India, Russia, and southern Eurasian countries, and demonstrates how the SCO's operations have evolved beyond its initial focus on security and stability to include cooperation with the UN, G20, BRICS, NATO, and ASEAN. As a conclusion to the volume's collective research, the authors have allowed for remarks and general suggestions. It is intended that the book would feed researchers' study and give decision-makers important SCO development proposals.

REFERENCES and NOTES

[1] Chao, W. C. (2022). The Political Economy of China's Rising Role in the Shanghai Cooperation Organization (SCO): Leading with Balance. *The Chinese Economy*, *55*(4), 293-302.

[2] Gladun, E. (2021). Collaboration and research as the key contribution to the BRICS environmental and sustainable development agenda. *BRICS Law Journal*, 8(2), 4–9.

[3] MacHaffie, J. (2021). Mutual trust without a strong collective identity? Examining the Shanghai cooperation organization as a nascent security community. *Asian Security*, *17*(3), 349-365.

[4] Agostinis, G., & Urdinez, F. (2021). The nexus between authoritarian and environmental regionalism: An analysis of China's driving role in the Shanghai cooperation organization. *Problems of Post-Communism*, 1-15.

[5] Komilov, I. I. (2022). Shanghai Cooperation Organization: Prerequisites for Creation and Current State. *Oriental Journal of History, Politics and Law*, *2*(02), 304-312.

https://doi.org/10.54934/ijlcw.v1i2.21

ABOUT THE AUTHOR

Saslina Kamaruddin – Faculty of Management & Economics, Sultan Idris Education University, Perak, Malaysia
e-mail: saslina@fpe.upsi.edu.my
ORCID ID: https://orcid.org/0000-0002-7356-3846
Google Scholar ID: https://scholar.google.com/citations?hl=en&user=_3UJDCcAAAAJ

Muhammad Izwan Ikhsan – Faculty of Law, Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus, Malaysia
e-mail: izwanikhsan@uitm.edu.my
ORCID ID: https://orcid.org/0000-0003-2635-0909
Google Scholar ID: https://scholar.google.com/citations?hl=en&user=DwZWmjcAAAAJ

ABOUT THIS ARTICLE

Conflict of interests: Authors declare no conflicting interests