

# National Identity Evolution

Hussam Elbehiery<sup>1</sup>, Khaled Elbehiery<sup>2</sup>

<sup>1</sup>Computer Networks Department, Ahrum Canadian University (ACU), Egypt

[hussam.elbehiery@gmail.com](mailto:hussam.elbehiery@gmail.com)

<sup>2</sup>Computer Information Systems Department, DeVry University, USA

[khaled.elbehiery@gmail.com](mailto:khaled.elbehiery@gmail.com)

## Abstract

Kidnapping is a global problem that affects countries all over the world. Kidnapping refers to the abduction and captivity of a person, typically to obtain a ransom. The practice of kidnapping has become quite lucrative for some, and there are criminal groups that have made it their business model. Governments are working hard to address this problem and ensure that the perpetrators are captured and brought to justice. Birth certificates and social security ID in some case could be intentionally hidden for abusive purposes or lost as a result of a neglect behavior. This research proposes a new simplified system for issuing the birthdate certificate in addition to utilizing QR Code for digital identification of the individuals to help the fights against kidnapping, human trafficking, or other threats. There are phases of implementing this proposal; one for the new born and the other for the adults. The new system information database will be integrated with other services such as social security administration, voting registrations, medical records, home land security, and other governmental departments to provide enough protection to the citizens.

**Keywords:** National ID, Age of Majority, Child abduction, QR Code, Blood types, DNA, Iris Scan, Tattoo.

## 1. Introduction

Having a birth certificate is a stepping stone to acquiring an array of rights and benefits, including other documents necessary to navigate inside and outside of one's home country. Despite the fact, the birth certificate plays an important role in our lives, many children in the developing countries do not obtain one. Birth registration is the official recording of a birth by the state, followed ideally by birth certification, which serves as proof of this recognition. This paper maintains that the ability to prove one's identity and age through legal documentation is vital for social inclusion. This research examines some of the crucial consequences of not acquiring birth certificate, and how to facilitate the process of birth registration and certification among citizens [1].

Given the anonymity that comes with modernization and mass society, reliance on traditional community-based methods to identify people is becoming ever less tenable. No doubt other factors generate problems but lacking a birth certificate or identity proof aggravates the problem. Legal empowerment matters for helping individuals gain access to services and protections based inequalities [2].

This research begins with discussing the birthdate certificate detail and its relationship to national identity documents, identity ID documents before age of majority. The children abduction and the negative effects related to lose the national identity documents is also covered.

A dedicated section for QR Code for digital documentation is covering all required information printed as a semi-permanent tattoo on human's body in case of birthdate certificates lost or protection against forgery.

Another section explains the individual's unique data and information that should be documented within the new QR Code for each individual such as blood types, DNA record, and iris scan. The research summarizes the various types of tattoo could be permanently printed on the human body and what could be the factors that affect its cost and its relationship to the individual's health. Finally, a simulation for the suggested design will be demonstrated.

## 2. Governmental documents for the ID

### 2.1 Birthdate Certificate

To be eligible for birth certificate of the child born issuing, a proof of citizenship of the father is required like valid passport or ID. Also the following is required:

- Valid father's and mother's original passports or ID.
- Father's and mother's original birth certificates

- Marriage certificate of the parents (not required in all countries).

Who has the right to submit the application: father, mother, or the legal guardians of the child are all permitted to submit the application [3].

## 2.2 National ID

A national identity document ("ID", "ID card", "identity card", "IC", "citizen card" or "passport card") is an identity card with photo, usable as an identity card at least inside the country, and which is issued by an official authority. The personality verification card is compulsory at the age of 16 or 18 issued by the registry office which is subordinate to the government [4].

In the absence of a formal identity document, a driver's license may be accepted in many countries for identity verification. Some countries do not accept driver's licenses for identification, often because in those countries they do not expire as documents and can be old or easily forged. Most countries accept passports as a form of identification. Some countries require all people to have an identity document available at any time. Many countries require all foreigners to have a passport or occasionally a national identity card from their home country available at any time if they do not have a residence permit in the country [5].

The identity document is used to connect a person to information about the person, often in a database. The photo and the possession of it is used to connect the person with the document. The connection between the identity document and information database is based on personal information present on the document, such as the bearer's full name, age, birth date, address, an identification number, card number, gender, citizenship and more. A unique national identification number is the most secure way, but some countries lack such numbers or don't mention them on identity documents [6] and [7].

Law enforcement officials claim that identity cards make surveillance and the search for criminals easier and therefore support the universal adoption of identity cards. In USA; the new Smart Identity Card has been introduced on 26 November 2018. Personal data on the smart identity card is fully protected and its security features, card durability as well as chip technology on personal data protection have been enhanced [8].

**Arguments for identity documents:** In order to avoid mismatching people, and to fight fraud, there should be a way, as securely as possible, to prove a person's identity. Every human being already carries their own personal identification in the form of DNA, which is extremely hard to falsify or to discard (in terms of modification). Even for non-state commercial and private interactions, this may shortly become the preferred identifier, rendering a state-issued identity card a lesser evil than the potentially extensive privacy risks associated with everyday use of a person's genetic profile for identification purposes.

**Arguments against identity documents:** The development and administration costs of an identity card system can be very high. In other countries the ID card is free. This, however, does not disclose the true cost of issuing ID cards as some additional portion may be borne by taxpayers in general.

**Arguments against overuse or abuse of identity documents:** Cards reliant on a centralized database can be used to track anyone's physical movements and private life, thus infringing on personal freedom and privacy. The management of disparate linked systems across a range of institutions and any number of personnel is alleged to be a security disaster in the making.

## 3. Identity ID documents before Age of Majority

The age of majority is the threshold of adulthood as recognized or declared in law. It is the moment when minors cease to be considered such and assume legal control over their persons, actions, and decisions, thus terminating the control and legal responsibilities of their parents or guardian over them. Most countries set the age of majority at 18, but some jurisdictions have a higher age and others lower.

The word majority here refers to having greater years and being of full age as opposed to minority, the state of being a minor. The law in a given jurisdiction may not actually use the term "age of majority". The term typically refers to a collection of laws bestowing the status of adulthood. The age of majority does not necessarily correspond to the mental or physical maturity of an individual [9].

Age of majority should not be confused with the age of maturity, age of sexual consent, marriageable age, school-leaving age, drinking age, driving age, voting age, smoking age, gambling age, etc., which each may be independent of and set at a different age from the age of majority. Although a person may attain the age of majority in a particular jurisdiction, they may still be subject to age-based restrictions regarding matters such as the right to vote or stand for elective office, act as a judge, and many others [10].

#### 4. Child abduction

Child abduction or child theft is defined as unauthorized removal of a minor (a child under the age of legal adulthood) from the custody of the child's natural parents or legally appointed guardians.

The Hague Convention on the Civil Aspects of International Child Abduction is an international human rights treaty and legal mechanism to recover children abducted to another country. The Hague Convention does not provide relief in many cases, resulting in some parents hiring private parties to recover their children.

A very small number of abductions result from - in most cases - women who kidnap babies (or other young children) to bring up as their own. These women are often unable to have children of their own, or have miscarried, and seek to satisfy their unmet psychological need by abducting a child rather than by adopting. The crime is often premeditated, with the woman often simulating pregnancy to reduce suspicion when a baby suddenly appears in the household. Some other abduction have been to make children available by child-selling for adoption by other people, without adopting parents necessarily being aware of how children were actually made available for adoption.

The biggest myth about child abduction is that the dangers to children come from strangers. Here's what to know and how to talk to your child about the real threats around abduction. Educating your child is the best way to keep them safe from abduction. The best place to start is by choosing opportunities or "teachable" moments to reinforce safety skills. For example, if an incident occurs in your community, and your child asks you about it, speak frankly but with reassurance. Explain to your children that you want to discuss the safety rules with them, so that they will know what to do if they are ever confronted with a difficult situation.

All what we know about could be considered as Child Abduction Prevention using the way of talking to kids and Teens, which could be not sufficient effective and regular, so we suggest in that research a technological method related to huge database to make the mission more easier for the governmental or the police to minimize the child abduction problems [11].

#### 5. QR Code Technology

The QR Code is a two-dimensional version of the barcode, known from product packaging in the supermarket. Originally developed for process optimization in the logistics of the automotive industry, the QR Code has found its way into mobile marketing with the widespread adoption of smartphones. "QR" stands for "Quick Response", which refers to the instant access to the information hidden in the Code. Significant advantages of QR Codes over conventional barcodes are larger data capacity and high fault tolerance.

The size of a QR code depends on several factors with the most important being the distance between the QR code and the mobile phone cameras. Other factors influencing the size and readability are: the amount of data in the QR code, the lighting conditions, the quality of the mobile phone camera and the reader software used to scan the QR code (see Table 1).

Table 1: Recommended QR code size use for a type4 QR code

Surface	Distance	Size
A4 type=Magazine	Distance 20 cm	20mm x 20mm
A3 type=Poster	Distance 1.5m	95mm x 95mm
3x4m type=Billboard	Distance 10m	380mm x 380mm

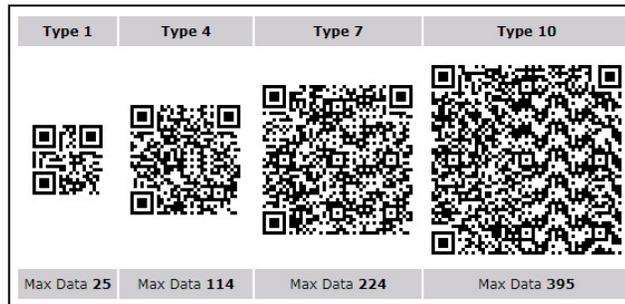


Fig. 1 Relative size differences of QR code types.

As can be seen in figure 1, the more data that is encoded in the QR code the bigger it gets. This can also have a big impact on the space required to display the QR code depending on the display medium used.

### 5.1 QR code size

To determine the size of QR code is not as easy as it seems, but in general, the bigger the better. The reason the size is not so obvious depends on several factors. The QR code print impression should be big enough for a mobile phone camera to be able to clearly focus on. Assuming you want the QR code to be printed as small as possible on your business card without taking up too much real estate and still work. QR codes can be used in two ways [12]:

**Direct QR Codes:** This is where all the information you want to hand over to an application that scans the code is encoded directly into the QR code. Little information like just a telephone number or e-mail address will produce a small QR code. However if you want to include your full name, address, websites and more in a typical vCard QR code, then it can become a much larger QR code that requires more space to be printed. Typically these kinds of QR codes are hell for printers and publishers as they often do not know the format of the QR code beforehand, and unless they actually have the QR code they will not be able to tell you how big it should be for your business card.

**Indirect QR Codes:** Here a fixed format QR code refers to web address that can supply the vCard information and potentially lots more, like a personal image, social media links, links to music and video and all from within a single small footprint QR code. With these types of QR codes organizations can easily roll out the use of QR codes on all business cards without the problem of variable information (variable QR code size). Making it easy and reliable to create and print business cards with QR codes that you know will work. An additional advantage to this QR code system is that even if the company moves to a new address or people are promoted, the information behind the QR code is updateable. Even if the information on the business card is out of date, the QR code is actual and up to date.

### 5.2 QR Code Storage Data

Standard QR Codes can hold up to 3Kb of data. QR Codes are made of multiple rows and columns. The combination of these rows and columns makes a grid of modules (squares). There can be a maximum of 177 rows and 177 columns which means the maximum possible number of modules is 31,329. With the naked eye these are just small squares and mean very little, but the exact arrangement of those modules allows the QR Code to encode its data. This means that unlike traditional barcodes which are 1 dimensional and use 1 row of lines, QR Codes use 2 dimensions which allows them to store a lot more data in the same area of space.

The QR Code standards don't allow you to create a QR Code with just any combination of rows and columns. There are 40 preset sizes that you must select from. These are referred to as versions. When a QR Code is being created, the QR Code generator assesses the amount of data you are trying to encode and from that it determines the version number that it needs to use. These levels allow the generator to encode a QR Code as efficiently as possible and means not every QR Code is forced to have 31,329 modules.

If a QR Code contains a lot of data, then you will generally see that it looks "busier" to the naked eye (more modules and generally more tightly packed together). Here are some examples that show the difference in appearance for codes holding different volumes of data as shown in figure 2 [13]:



Fig. 2 QR Code different volumes of data.

In addition to storing the actual data a user wishes to save, the QR Code must also store other data that forms the framework of QR Codes. This includes positioning, timing, alignment and format data as well as error correction and version data. All of this data when combined ensures a QR Code can be read easily by a wide range of scanners (see figure 3).

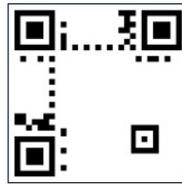


Fig. 3. QR Code dimensions

There are also other less common types of QR Codes you should be aware of, like Micro QR Codes which are smaller and hold a lot less data, and iQR Codes which allow a lot more rows and columns, therefore more modules and ultimately more data [14].

## 6. Required Information for the new printed QR Code

### 6.2 Blood types

There are four main blood groups (types of blood): A, B, AB and O. Blood group is determined by the genes inherited from the parents. Each group can be either RhD positive or RhD negative, which means in total there are eight main blood groups.

**The ABO system:** There are four main blood groups defined by the ABO system:

- **blood group A:** Has A antigens on the red blood cells with anti-B antibodies in the plasma
- **blood group B:** Has B antigens with anti-A antibodies in the plasma
- **blood group O:** Has no antigens, but both anti-A and anti-B antibodies in the plasma
- **blood group AB:** Has both A and B antigens, but no antibodies

Receiving blood from the wrong ABO group can be life threatening. For example, if someone with group B blood is given group A blood, their anti-A antibodies will attack the group A cells. This is why group A blood must never be given to someone who has group B blood and vice versa. As group O red blood cells don't have any A or B antigens, it can safely be given to any other group.

**The Rh system:** Red blood cells sometimes have another antigen, a protein known as the RhD antigen. If this is present, your blood group is RhD positive. If it's absent, your blood group is RhD negative. This means anyone can be one of eight blood groups:

- A RhD positive (A+)
- A RhD negative (A-)
- B RhD positive (B+)
- B RhD negative (B-)
- O RhD positive (O+)

- O RhD negative (O-)
- AB RhD positive (AB+)
- AB RhD negative (AB-)

In most cases, O RhD negative blood (O-) can safely be given to anyone. It's often used in medical emergencies when the blood type isn't immediately known. It's safe for most recipients because it doesn't have any A, B or RhD antigens on the surface of the cells, and is compatible with every other ABO and RhD blood group [15].

## 6.2 DNA Analysis

A genealogical DNA test is a DNA-based test which looks at specific locations of a person's genome, in order to find or verify ancestral genealogical relationships or (with lower reliability) to estimate the ethnic mixture of an individual.

Three principal types of genealogical DNA tests are available, with each looking at a different part of the genome and useful for different types of genealogical research: autosomal, mitochondrial (mtDNA), and Y-DNA.

A genealogical DNA test is performed on a DNA sample. This DNA sample can be obtained by a cheek-scraping (also known as a buccal swab), spit-cups, mouthwash, and chewing gum (see figure 4).



Fig. 4 A hospital corpsman uses a swab to take a DNA sample.

**Benefits:** Genealogical DNA tests have become popular due to the ease of testing at home and their usefulness in supplementing genealogical research. Genealogical DNA tests allow for an individual to determine with high accuracy whether he or she is related to another person within a certain time frame, or with certainty that he or she is not related. DNA tests are perceived as more scientific, conclusive and expeditious than searching the civil records. However, they are limited by restrictions on lines that may be studied. The civil records are always only as accurate as the individuals having provided or written the information.

**Drawbacks:** Common concerns about genealogical DNA testing are cost and privacy issues. Some testing companies retain samples and results for their own use without a privacy agreement with subjects.

Autosomal DNA tests can identify relationships but they can be misinterpreted. For example, transplants of stem cell or bone marrow will produce matches with the donor. In addition, identical twins (who have identical DNA) can give unexpected results (see figure 5) [16].



Fig. 5 Genealogical DNA testing sample.



**Shortcomings:** Many commercial iris scanners can be easily fooled by a high quality image of an iris or face in place of the real thing. The scanners are often tough to adjust and can become bothersome for multiple people of different heights to use in succession. The accuracy of scanners can be affected by changes in lighting. Iris scanners are significantly more expensive than some other forms of biometrics, as well as password and proximity card security systems.

Iris recognition is very difficult to perform at a distance larger than a few meters and if the person to be identified is not cooperating by holding the head still and looking into the camera. However, several academic institutions and biometric vendors are developing products that claim to be able to identify subjects at distances of up to 10 meters ("Standoff Iris" or "Iris at a Distance" as well as Princeton Identity's "Iris on the Move" for persons walking at speeds up to 1 meter/sec) [21]. Iris recognition solutions mainly are for criminal investigation, immigration control, and national identification systems in different regions around the world (see figure 8).



Fig. 8 Iris scan operation in airports correlated to database.

Technological companies promote equal access to administrative services by providing legal identification for all citizens. By enhancing security of national ID systems, our solution contributes to realizing more advanced national identification services [22].

## 7. Tattoo

Getting a tattoo is a big commitment. Tattoo artists, friends, or people, in general, will urge you to sit on your decision of getting a tattoo. Unlike a new hairdo or a new outfit, getting a tattoo is permanent. It's not something you get to erase or change when you feel like it. So before you decide to get one, think hard and long about how much you're willing to spend on it (see figure 9).

Here is a list of the factors that affect the cost of getting a tattoo: Design, Number of Colors, Size, Placement, and the Artist's expertise or the machines will be used.

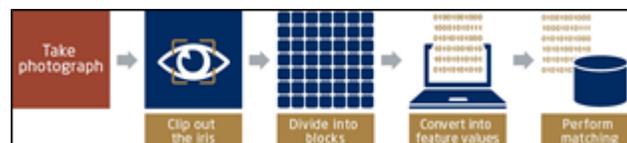


Fig. 9 Human body areas sensitivity to Tattoo.

It's better to have a list of the things you should consider in deciding whether or not you'll get a tattoo. It's not as simple as wanting it because a tattoo is a big commitment both to your wallet and to your body. To help you make a more informed decision, here are a few things you should consider when you get a tattoo:

### Permanence:

Tattoos are permanent. Whether you regret it or not, a tattoo once applied is always going to be part of you literally. There are ways to get rid of it but those ways are expensive, invasive, and painful. What makes it worse is that there is no guarantee if after going through those treatments that your tattoo will disappear.

### Pain:

The next thing you have to think about is the pain. At the very least, a tattoo will hurt. But this still depends on your pain tolerance, placement of the tattoo, and tattoo artist.

**Health:**

The smart thing to do when you decide to get a tattoo is to consult with a doctor. The important thing to take note is if a tattoo will not cause any skin allergies. Even if you say that you are allergic to shellfish, you still have to ask for your doctor’s approval in spite of food allergies being different from ink allergies.

Moreover, getting checked for ink reactions is a good idea so that you know how your skin will react to it. You do not want to be surprised to see rashes and itchiness when you can avoid it.

**8. Experimental Work (QR Code human print simulation)**

QR Codes are 2D barcodes that store alphanumeric information. And this information is stored in the dots of their intricate design (data modules). So it is important to make sure that the tattoo scans well. In addition, the content in the QR Code should be permanent. And certainly wouldn’t want to be stuck with a tattoo that is not scannable.

A static QR Code is permanent in nature. Once you create it, you cannot edit it. And it remains functional forever. It is unlike a Dynamic QR Code that can be edited anytime you want. That means, it is not permanent. And if your QR Code generator shuts in the future, your QR Code will become non-functional too.

So what you can do is—rather than encoding content such as a website address, go for simple text in a static QR Code. It can be anything that matters to you. For example—a quote, life motto, or your mother’s name (see figure 10) [23].



Fig. 10 Human body QR Code Tattoo sample.

**8.1 QR Code Size**

The size of a QR code depends on several factors with the most important being the distance between the QR code and the mobile phone cameras. Other factors influencing the size and readability are: the amount of data in the QR code, the lighting conditions, the quality of the mobile phone camera and the reader software used to scan the QR code.

**8.2 What can be stored in a QR Code?**

Not less than 7089 digits or 4296 characters, including punctuation marks and special characters, can be entered in one Code. In addition to numbers and characters, words and phrases (e.g. Internet addresses) can be encoded as well. As more data is added to the QR Code, the Code size increases and the Code structure becomes more complex.

**QR Code Data Types**

- Numeric (Only numeric)
- Alphanumeric (Capital ASCII letters and numbers)
- Binary (Bytes - Hexidecimal)

Table 2: QR code versions and the suggested sizes

QR Code Version	Modules XY Grid	Numeric Just Numbers	Alphanumeric Letters & Numbers	Suggested Tattoo Size
1	21 x 21	34	20	2.00 in (5.08 cm)
2	25 x 25	63	38	2.38 in (6.05 cm)
3	29 x 29	101	61	2.76 in (7.02 cm)

4	33 x 33	149	90	3.14 in (7.98 cm)
5	37 x 37	202	122	3.52 in (8.95 cm)
6	41 x 41	255	154	3.90 in (9.92 cm)
7	45 x 45	293	178	4.29 in (10.89 cm)
8	49 x 49	365	221	4.67 in (11.85 cm)
9	53 x 53	432	262	5.05 in (12.82 cm)
10	57 x 57	513	311	5.43 in (13.79 cm)

### 8.3 How do I scan a QR Code?

To scan a QR Code, you first need to have a scanner app on your smartphone. A large selection of these can be downloaded for free in the various app stores. When you have installed one, start the application and keep the camera of your smartphone over the QR Code to scan it. If the Code is readable, the encoded address or action will be accessed automatically.

### 8.4 What happens if a QR Code is damaged?

To ensure that the information contained in the QR Code can be read even if it is damaged, the data keys include duplications (redundancies). Because of this, up to 30% of the Code structure can be destroyed without affecting the readability of the Code.

### 8.5 Applicable considerations

A healed tattoo had been measured to approximate the printing resolution of skin. The average is 42 dpi, but that leaves no room for error. Decreasing the resolution to 10 dpi to allow for some distortion and blending over time was the suggestion (see figure 11).

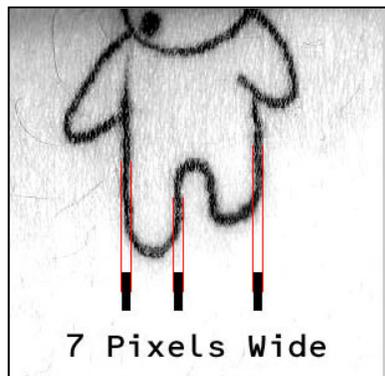


Fig. 11 QR Code Tattoo resolution.

Tattoos do change with age, and that will affect the accuracy. Certain parts of the body like the shoulders and back do not expand as much. Selecting a flat surface on the back will also make it easier to scan.

One last suggestion for the tattoo artist would be to under ink the tattoo instead of over filling the black areas. If the black ink expands too much, it can ruin the white areas. You can always add a dot later if you need a touch up, but you cannot subtract from a tattoo [24].

Some examples in the next figures express the different trials for human body in various places as shown in figure 12.



Fig. 12 QR Code Tattoo trials in various places over human body.

## 9. Conclusion

Child Abduction occurs when a child is taken, wrongfully retained, or concealed by a parent or others depriving another individual of their custody or visitation rights. Under any circumstances, abduction is considered a crime under federal or state law, and criminal statutes vary across the country about what conduct is considered unlawful. Verifying the identity of a child takes a little bit more organizational and planning efforts because they don't normally have the same forms of ID as an adult. There are several reasons you might need to verify your child's identity, including to enroll them in school or sports, and to place them on your insurance policy. Luckily with a little bit of help from vital records providers, you can be ready with the required documents to verify the identity of your child. The proposal we have introduced during this publication suggested a QR Code printed as a human tattoo for all personal and biometric information for identity verification.

Not only QR Codes are becoming more common these days but also, we may even start to see more intuitive ways of deceiving people via QR Codes. Someday we are really pleased to see biometric authentication growing in popularity, but it needs to be implemented correctly and securely to build consumer trust and confidence in the technology. Databases of biometric reference data need to be tightly protected and iris scanning should preferably be combined with another means of authentication, such as fingerprint sensors, to reinforce the level of security.

In an era of constant hacking threats, traditional usernames and passwords are more vulnerable than ever. As well as being increasingly difficult to remember as they get more complex, it's still possible for hackers or other third parties to crack them. To improve security and provide a better consumer experience, many companies and sectors are looking at providing additional security layers by which users can identify themselves. Biometric approaches are becoming a popular choice with iris scanning being increasingly adopted into everyday life. While fingerprints are constantly exposed and susceptible to damage, the iris is naturally protected by the cornea (the eye's transparent front coating) and its pattern seems to remain reliably unchanged for decades (though not necessarily for life). Unlike fingerprint scanners, which need direct contact and have to be kept spotlessly clean, iris scans can be performed safely and hygienically at some distance from the eye.

## Acknowledgments

The authors would like to thank *DeVry University, USA* and *Ahram Canadian University (ACU), Egypt* for their support to introduce this research paper in a suitable view and as a useful material for researchers. The authors also would like to thank their colleagues who provided insight and expertise that greatly assisted the research.

## References

- [1] Okwuagbala Uzochukwu Mike P, "Kidnapping: Overview, Causes, Effects, and Solutions," Owlcation.com, Copyright © 2019 HubPages Inc., June 11, 2019. [Online] Available: <https://owlcation.com/social-sciences/Kidnapping-Overview-Causes-Effects-and-Solutions>
- [2] Wendy Hunter, "Identity Documents, Welfare Enhancement, and Group Empowerment in the Global South," *The Journal of Development Studies*, Pages 366-383, 26 Mar 2018. [Online] Available: <https://www.tandfonline.com/doi/full/10.1080/00220388.2018.1451637>
- [3] "Registration of birth in the Population Register System," Finland's missions abroad, Finland Abroad website, Ministry for Foreign Affairs of Finland. [Online] Available: <https://finlandabroad.fi/web/egy/birth-registration>
- [4] Serene S Koh, "National Identity and Young Children: A Comparative Study of 4th and 5th Graders in Singapore and the United States," A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy (Education) in the University of Michigan, 2010.
- [5] "Why is national identity important," Palo Alto Networks, Prisma™ Public Cloud. End cloud security anxiety, Quora Inc. © 2019, May 12, 2018. [Online] Available: <https://www.quora.com/Why-is-national-identity-important>
- [6] Margaret Rouse, "National identity card," TechTarget, Copyright 2000 - 2019. [Online] Available: <https://searchsecurity.techtarget.com/definition/national-identity-card>
- [7] "Appointment Booking (Territory-wide Identity Card Replacement Exercise)," Immigration Department, The Government of the Hong Kong Special Administrative Region. [Online] Available: <https://www.smartid.gov.hk/en/>
- [8] "Personal Data Protection," Immigration Department, The Government of the Hong Kong Special Administrative Region. [Online] Available: <https://www.smartid.gov.hk/en/Persona-Data-Protection/index.html>

- [9] PACER's, "Prepare Your Child for Age of Majority and Transfer of Rights," Inspiring Possibilities, National Parent Center on Transition and Employment. ©2015 PACER Center, Inc. NPC-19.
- [10] "Age of Majority," Center for Parent Information and Resources, Nov 1, 2017. [Online] Available: <https://www.parentcenterhub.org/age-of-majority/>
- [11] National Center for Missing and Exploited Children, "Child Abduction Prevention: Talking to Kids & Teens," Parents.com, Parents Network. © Copyright 2019 Meredith Corporation. [Online] Available: <https://www.parents.com/kids/safety/stranger-safety/talking-to-kids-teens-about-safety-abduction/>
- [12] "QR Code Basics," © QRCode-Generator.de 2019. [Online]. Available: <https://www.qr-code-generator.com/qr-code-marketing/qr-codes-basics/>
- [13] Lee Taylor, "How Much Data Can A QR Code Store?," Everything You Need To Know, Feb 2017. [Online] Available: <http://qrcode.meetheed.com/question7.php>
- [14] Lee Taylor, "How Secure is a QR Code?," Everything You Need To Know, Feb 2017. [Online] Available: <http://qrcode.meetheed.com/question10.php?s=s>
- [15] NHS, "Blood groups," © Crown copyright, Last reviewed: 12 May 2017. [Online] Available: <https://www.nhs.uk/conditions/blood-groups/>
- [16] Rafi Letzter, "I Took 9 Different Commercial DNA Tests and Got 6 Different Results," Live Science, © Future US, Inc., November 05, 2018. [Online] Available: <https://www.livescience.com/63997-dna-ancestry-test-results-explained.html>
- [17] Chris Woodford, "Iris scans," Explainthatstuff, July 8, 2018. copyright © Chris Woodford 2009, 2018. [Online] Available: <https://www.explainthatstuff.com/how-iris-scans-work.html>
- [18] Handbook of Iris Recognition by Mark J. Burge and Kevin Bowyer (eds). Springer, 2013. A cutting-edge collection of the latest iris scanning research.
- [19] JustAskGemalto, "What is iris scanning and where is it used?," Thalesgroup Company. [Online] Available: <https://www.justaskgemalto.com/en/iris-scanning-used/#>
- [20] Electronic Frontier Foundation (EFF), "Iris Recognition," STREET-LEVEL SURVEILLANCE. [Online] Available: <https://www.eff.org/pages/iris-recognition>
- [21] NEC, "Iris Recognition," [Online] Available: <https://www.nec.com/en/global/solutions/biometrics/iris/index.html>
- [22] Hunny Mehrotra, Mayank Vatsa, Richa Singh, and Banshidhar Majhi, "Does Iris Change Over Time?," National Center for Biotechnology Information, U.S., Nov 7, 2013. [Online] Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3820685/>
- [23] Jack, "Tattoo Prices: Knowing How Much Your Tattoo Will Cost," Prochronism.com. [Online]. Available: <https://www.prochronism.com/tattoo-cost>
- [24] Gautam Garg, "QR Code Tattoo: Best Practices And Everything You Need To Know," © 2019 Scanova, March 27, 2015. [Online] Available: <https://scanova.io/blog/blog/2015/03/27/qr-code-tattoo/>

**Hussam Elbehiery** Head of Computer Networks Department, Faculty of Computer science and Information Technology, Ahram Canadian University (ACU), Egypt.

**Khaled Elbehiery** Visiting Professor of Computer Networking and Cloud Engineering at DeVry University and Park University, USA.