VIT UNIVERSITY

Digital Watermarking and Stegano.

PROJECT REPORT

TOPIC – Securing Adhar Card Using Steganography

Guided by – KANNADASAN R

Submitted by -

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CERTIFICATE

This is to certify that the project work entitled “Securing Adhar Using Steganography” that is being submitted by P.VENKATA PRABHAT, P.JEEVAN SAI KUMAR ,M.RAGHU VAMSI,SARVEPALLI MOHITH is a record of bonafide work done under my supervision. The contents of this Project work, in full or in parts, have neither been taken from any other source nor have been submitted for any other CAL course.

Place : Vellore

Date : 17 - September, 2019

ACKNOWLEDGEMENT

We are using this opportunity to express our gratitude to everyone who supported us throughout the course of this project (“Securing Adhar Using Steganography”). We are thankful for their aspiring guidance, invaluably constructive criticism and friendly advice during the project work. We are sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to the project.

We express our warm thanks to our faculty Prof.KANNADASAN R for their support and guidance at VIT UNIVERSITY.

We would also like to thank VIT UNIVERSITY and all the people who provided us with the facilities being required and conductive conditions for our project.

THANK YOU

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ABSTRACT

Data privacy relates to how a piece of information—or data should be handled based on its relative importance. For instance, you likely wouldn't mind sharing your name with a stranger in the process of introducing yourself, but there's other information you wouldn't share, at least not until you become more acquainted with that person.Open a new bank account, though, and you'll probably be asked to share a tremendous amount of personal information, well beyond your name. In the digital age, we typically apply the concept of data privacy to critical personal information, also known as personally identifiable information (PII) This can include Social Security numbers, health and medical records, financial data, including bank account and credit card numbers, and even basic, but still sensitive, information, such as full names, addresses and birthdates. The list of personal information can be pretty extensive

When data that should be kept private gets in the wrong hands, bad things can happen. A data breach at a government agency can, for example, put top secret information in the hands of an enemy state.A breach at a corporation can put proprietary data in the hands of a competitor. A breach at a school could put students' PII in the hands of criminals who could commit identity . theft. A breach at a hospital or doctor's office can put PHI in the hands of those who might misuse it.

Aadhaar Database is one of the largest government databases on the planet, where a 12 digit unique-identity number has been assigned to the majority of the Indian citizens. This database contains both the demographic as well as biometric data of the citizens. With the sheer amount of private and confidential data amassed in one singular database, it is no surprise that Aadhaar and Unique Identification Authority of India (UIDAI), the authority that established the database, continue to be the focus of attention whenever there is any security shortcoming.

Irrespective of the number of complaints and objections against the program, the government of India has made it mandatory in almost all the facets of public life. Despite the number of reports over the last couple of years, UIDAI has constantly maintained that the server and the data itself, especially biometric data I safe. We are not contesting the claims by the authority. However, we do think that the number of security incidents has increased in past few years and we wanted to highlight everything major that has happened.

Most recently, the entire controversy around Aadhaar and privacy concerns, captured centre stage after a French security researcher ponted the flaws in the mAadhaar app that is available on the Google Play Store. What is striking is the fact that this is not the first time when the issue has been raised about a government mobile app with flaws that can potentially allow attackers to access the Aadhaar database while accessing the demographic data.

INTRODUCTION

We are gonna use image steganography to hide and protect our personal data in the aadhar card itself. The aadhar image will act as a stego image for our personal details. The qr code will act as our cover image. Now when a normal person sees the qr he wont be able to extract the information while the receiver using the key and qr scanner will get all the details. Thus the data is protected from eavesdroppers and reaches safely in the hands of the desired person.

METHODOLOGY

I.

Figure 1: The Qr code Generated By Us

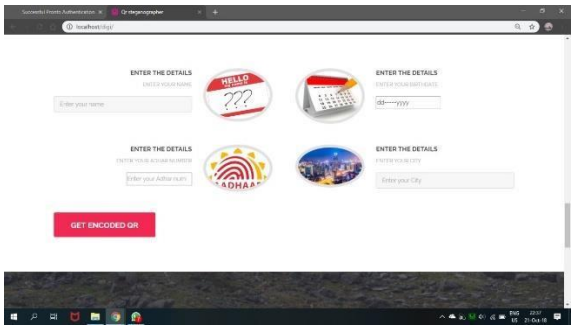


Fig 2: Our Website form to generate secure QR

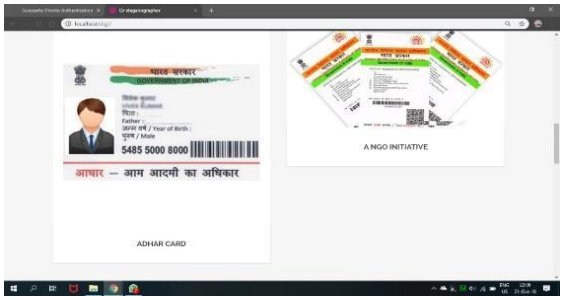


Fig 3: Details segment of website

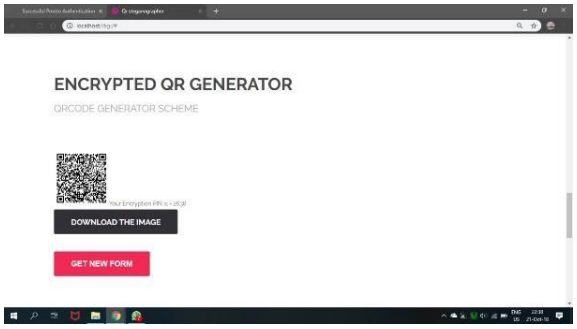


Fig 4: The secured Qr generated using our Website

- 1) The qrcode is generally generated, on show solely the adhar range of the shopper.
- 2) A four digit pin is arbitrarily generated.
- 3) The knowledge is then hidden victimisation the pin within the most applicable space of the QR code.
- 4) To hide the info the info is reborn into computer code and so to binary
- 5) This binary knowledge is place within the corrosponding pixels of the generated QR code.
- 6) This knowledge currently may be solely decrypted with the person victimisation our web site and possessing the key.

Literature Survey

- [1] Digital 3D Barcode Image as a instrumentality for knowledge concealing victimisation Steganography, avatar blue blood - Department of laptop Engineering Punjabi University, Patiala, knowledge may be hid in 3D Barcode pictures. 3D barcodes ar typically diagrammatical by victimisation color as a 3rd dimension. we tend to projected a framework for generating a 3D colored barcode from monochrome barcode thus activity the key knowledge among the smallest amount very important bits of the generated barcode. New technique for concealing info among the smallest amount very important bits of a colored 3D barcode image.
- Advantages: -
- • High knowledge embedding capability.
- • Increases the quality of stego image.
- • 3D barcodes are high temperature resistant.
- • 3D Barcodes do not make use of any error corrections levels because it is very difficult to modify the encoded information.

- Increases the embedding capacity of 3D colored Barcode Images Disadvantages: -
- 3D barcodes are costly to generate because it needs RGB 3 colurs to map on a single set of barcode as well as the data.
- The generation of these color barcodes require proper knowledge of color modes and programming languages.
- 3D barcodes are scanned with the help of special type of scanners that read height as a function of time the laser light takes to travel to the code section and projects back.
- [2] Data Hiding Using Steganography, Monica Adriana, University Politehnica of Bucharest, Faculty of Automatic Control and Computers, Computer Science
- Engineering Department, monica.dagadita@cti.pub.ro, emil.slusanschi@cs.pub.ro, Using one bit from each color component of a pixel, we get three bits per pixel; this means we need three pixels to hide a letter, i.e. one byte. Altering the smallest amount vital bits can lead to a color slightly totally different from the first one. What is most important to steganography is the fact that the human eye is unable to detect such differences. Recovery of Data: - The process of data recovery is a very simple one. The needed input is the image and the number of bits used. After reading the color values for each pixel, extracting the corresponding bits and concatenating their values, the hidden character can be easily recovered.
- Advantages: -
- Helps in speeding up the encoding processes.
- Boss - worker model helps in increasing parallelinsm.
- Data hiding and recovery dosen't depend on each other hence threads can have any set of combination.
- Messege is invisible to the human eye which is not the case cryptography.
- By using both steganography a cryptography one could create a powerful tool for data hiding-more powerful than either technique, if applied on itself.
- Disadvantages: -
- Size of the cover image must be hidden.
- In case more than three bits must be used from each color component,

- there is a high probability of the message's presence to be detected.
- [3] Comparison of Various Encryption Algorithms and Techniques for improving secured data Communication Soheila Omer AL Faroog Mohammed Koko, 2Dr.Amin Babiker A/Nabi Mustafa 1 AL Neelain University, Faculty of Engineering. Khartoum, Sudan 2 Dean of Faculty of Engineerning, AL Neelain University, Khartoum, Sudan, It's comparing various cryptographic algorithms
- on the basis of their processing powers, computational cost, and complexity and time complexity. Basically, all the algorithms are run together on a similar computer and similar input to get the results.
- Advantages: -
- Security: No other attacks can crack this encryption other than brute force
- Easily implementation on both hardware and software
- Parallelism is possible in AES with is very important for our project.
- Flexible keys.
- Low memory requirement
- Disadvantages: -
- Encryption and decryption both requires separate space.
- [4] A Survey on Various Cryptography Techniques Mitali - Vijay Kumar, Arvind Sharma, Swami Devi Dyal Group of Professional Institutions, Barwala, Distt. Panchkula, Haryana, India, It compares between symmetric and asymmetric encryption and gives the advantages and disadvantages of it.
- Advantages: -
- To know the best algorithm for our project.
- By the help of this paper we have idea of all the encryption algorithm Disadvantages: -
- More computation al power is used.Complexity of the project is increased
- CODE

```
<!DOCTYPE HTML>

<html>

    <head>
```

```
		<title>Qr steganographer</title>
		<meta charset="utf-8" />
		<meta name="viewport" content="width=device-width, initial-scale=1" />
		<link rel="stylesheet" href="assets/css/main.css" />
	</head>
	<body class="landing">

		<!-- Header -->
			<header id="header" class="alt">
				<h1>SteganoGraphy <strong><a href="index.php"> By 16BCI-02,06,22,43,134</a></strong></h1>
				<nav id="nav">
					<ul>
						<li><a href="index.php">Home</a></li>
						<li><a href="#one">How to use</a></li>
						<li><a href="#three">Do it</a></li>
						<li><a href="#footer">About Us</a></li>
					</ul>
				</nav>
			</header>

			<a href="#menu" class="navPanelToggle"><span class="fa fa-bars"></span></a>

		<!-- Banner -->
			<section id="banner">
				<h2>Key steganography with QR</h2>
				<ul class="actions">
					<li><a href="#thste" class="button special big">Get Started</a></li>
				</ul>
			</section>

			<!-- One -->
				<section id="one" class="wrapper style1">
```

```
<div class="container 75%">
<div class="row 200%">
<div class="6u 12u$(medium)">
<header class="major">
<h2>Project Describtion</h2>
<p>The project concerntrates on hiding a secret data in a file</p>
</header>
</div>
<div class="6u$ 12u$(medium)">
<p>Encrypt your Adhar details with us to stay away from the Identity Thugs. It protects you from the ID theft No unintended person can get your data without your concent even if he gets the Qr code</p>
<p>To Encrypt Click on DO IT option over the top. Fill the asked details over there <strong> Remember the Pin Provided.</strong> Save the Qr Image generated</p>
</div>
</div>
</div>
</section>

<!-- Two -->
<section id="two" class="wrapper style2 special">
<div class="container">
<header class="major">
<h2>Digital Watermarking and Steganography Project</h2>
<p>Guided By Dr. Thenmozhi T</p>
</header>
<div class="row 150%">
<div class="6u 12u$(xsmall)">
<div class="image fit captioned">
<img src="images/img01.jpg" alt="" />
<h3>Adhar Card</h3>
</div>
</div>
```

```
                                        <div class="6u$ 12u$(xsmall)">
                                            <div class="image fit captioned">
                                                <img src="images/img02.png"
alt="" />
                                                <h3>A NGO Initiative</h3>
                                            </div>
                                        </div>
                                    </div>
                                    <ul class="actions">
                                        <li><a href="#three" class="button special big">Create
Safe QR</a></li>
                                        <li><a href="#four" class="button big">Get the data
out of QR</a></li>
                                    </ul>
                                </div>
                            </section>
                        <!-- Three -->
                        <div id="thste">
                        <?php
                        if(isset($_POST['un'])&&isset($_POST['adn'])&&isset($_POST['cty'])&&isset($_POST['dob']))
                        {
                            include "Qr/qrlib.php";
                    include "config.php";
                            $un=htmlentities($_POST['un']);
                            $adn=htmlentities($_POST['adn']);
                            $cty=htmlentities($_POST['cty']);
                            $dob=htmlentities($_POST['dob']);
                            $qrn="qrlate".rand();
                            $_GLOBALS['qrno']=$qrn;
                            $message="The Adhar number of the client is = ".$adn.".  Have a nice day ";
                            $qrs = QRcode::png($message,"userQr/$qrn.png","H","3","3");
                            $qrimage = $qrn.".png";
                                $workDir = $_SERVER['HTTP_HOST'];
```

```
                                        $qrc="/digi/userQr/".$qrn.".png";
                                $qrlink = $workDir.$qrc;
include('functions.php');
                                        $iloc="userQr/".$qrn.".png";
                                        $ip=imagecreatefrompng($iloc);
                                        $messhide="Name: ".$un." DOB: ".$dob." City: ".$cty."Adhar number: ".$adn;
                                        $binm=toBin($messhide);
                                        $pin=999+(rand()%9000);
                                        $binp=toBin($pin);
                                        //echo "<br> binary pin = $binp";
                                        $lim=getimagesize($iloc);
                                        $wid=$lim[0];
                                        $hei=$lim[1];
                                        $iw=19;
                                        $ih=40;
                                        $im=$ip;
                                        $pc=0;
                                        $x=0;
                                                while($x<strlen($binm))
                                                {
                                                        $iw++;
                                                        if($iw>$wid-20)
                                                        {
                                                                $iw=20;
                                                                $ih++;
                                                        }
                                                        if($pc>=strlen($binp))
                                                                $pc=0;
                                                        if($binp[$pc++]==1)
                                                        {
                                                                //echo "</br> replacing at ($ih,$iw) =
$binm[$x]";
                                                                $rgb = imagecolorat($im,$iw,$ih);
                                                                 //echo "</br> Bit balue = $rgb <br>replacing
```

```
at ($ih,$iw) = $binm[$x]<br>";
                                                                        /*print_r($rgb);
                                                                        $r = ($rgb >>16) & 0xFF;
                                                                        $g = ($rgb >>8) & 0xFF;
                                                                        $b = $rgb & 0xFF;
                                                                        echo "<br> calculated RGB values are = $r $g
$b";
                                                                        $newR = $r;
                                                                        $newG = $g;
                                                                        $newB = $binm[$x++];
                                                                        //$newB = toBin($b);
                                                                        //$newB[strlen($newB)-1] = $binm[$x++];
                                                                        echo "<br>Changes calculated RGB values are
= $newR $newG nb = $newB<br>";
                                                                        //$newB = toString($newB);
                                                                        //$new_color =
imagecolorallocate($im,$newR,$newG,$newB);*/
                                                                        $new_color=$binm[$x++];
                                                                        //echo "<br> New color at this position is
$new_color replaced at ($ih,$iw)<br>";
                                                                        imagesetpixel($im,$iw,$ih,$new_color);
                                                                }
                                                        }
                                                        $enp="encoded/".$qrn.".png";
                                                imagepng($im,$enp);
                                                $enp="localhost/digi/".$enp;
                                                $co=mysqli_connect('localhost','root','','digi');
                                                $qu="insert into adhar
values('".$adn."','".$un."','".$dob."','".$cty."','".$qrlink."','".$enp."','".$pin."');";
                                                $re=mysqli_query($co,$qu);

                                        echo "
                                        <section id=\"three\" class=\"wrapper style1\">
                                                <div class=\"container\">
                                                        <header class=\"major special\">
                                                                <h2>Encrypted QR generator</h2>
```

QRcode generator Scheme

</header>

<div class=\"feature-grid\">

<div class=\"feature\">

<img src=\"encoded/";

echo $qrn.".png\" alt=\"image is here\" />Your Encryption PIN is = $pin</br>Download the Image

<ul class=\"actions\">

<button class=\"button special big\">Get new form</button>

";

}

else

echo "

<section id=\"three\" class=\"wrapper style1\">

<div class=\"container\">

<form method=\"POST\" action=\"#\">

<header class=\"major special\">

<h2>Encrypted QR generator</h2>

QRcode generator Scheme

</header>

<div class=\"feature-grid\">

<div class=\"feature\">

<div class=\"image rounded\">

<div class=\"content\">

<header>

<h4>Enter the details</h4>

Enter your name

```
                                                    </header>
                                                      <input type=\"text\" name=\"un\"
placeholder=\"Enter your name\">
                                                    </div>
                                                </div>
                                                <div class=\"feature\">
                                                    <div class=\"image rounded\"><img
src=\"images/dob.jpeg\" alt=\"\" /></div>
                                                    <div class=\"content\">
                                                    <header>
                                                    <h4>Enter the details</h4>
                                                    <p>Enter your Birthdate</p>
                                                    </header>
                                                    <input type=\"date\" name=\"dob\"
placeholder=\"Enter your Birthdate\"></div>
                                                </div>
                                                <div class=\"feature\">
                                                    <div class=\"image rounded\"><img
src=\"images/adhlogo.png\" alt=\"\" /></div>
                                                    <div class=\"content\">
                                                        <header>
                                                    <h4>Enter the details</h4>
                                                    <p>Enter your Adhar number</p>
                                                    </header>
                                                    <input type=\"number\" name=\"adn\"
placeholder=\"Enter your Adhar number\"></div>
                                                </div>
                                                <div class=\"feature\">
                                                    <div class=\"image rounded\"><img
src=\"images/city.jpg\" alt=\"\" /></div>
                                                    <div class=\"content\">
                                                        <header>
                                                    <h4>Enter the details</h4>
                                                    <p>Enter your City</p>
                                                    </header>
                                                    <input type=\"text\" name=\"cty\"
placeholder=\"Enter your City\">
```

```
                                                    </div>
                                                </div>
                                            </div>
                                        <ul class=\"actions\">
                                            <li><input type=\"submit\" class=\"button special big\" value=\"Get
encoded QR\"></li>

                                        </ul>
                                        </form>

                                            </div>
                                        </section>
                                        ";

                                        ?>
                                        </div>

                                <!-- Four -->
                                        <section id="four" class="wrapper style3 special">
                                            <div class="container">
                                                <header class="major">
                                                    <h2>Decoding the encoded data</h2>
                                                    <p>Select the Steganographed image</p>
                                                </header>
                                                <form method="POST" action="#" enctype="multipart/form-
data">
                                                    <header class="major">
                                                    <p>File</p><input type="file" name="decimg"
class="button special big" placeholder="Select the Qr image" required><br>
                                                    <p>Pin</p><input type="number" name="pin"
placeholder="Enter the Pin" required>
                                                    <br><br>
                                                <ul class="actions">
                                                    <li><input type="submit" class="button special big"
value="Decode the message"></li>
                                                </ul>
```

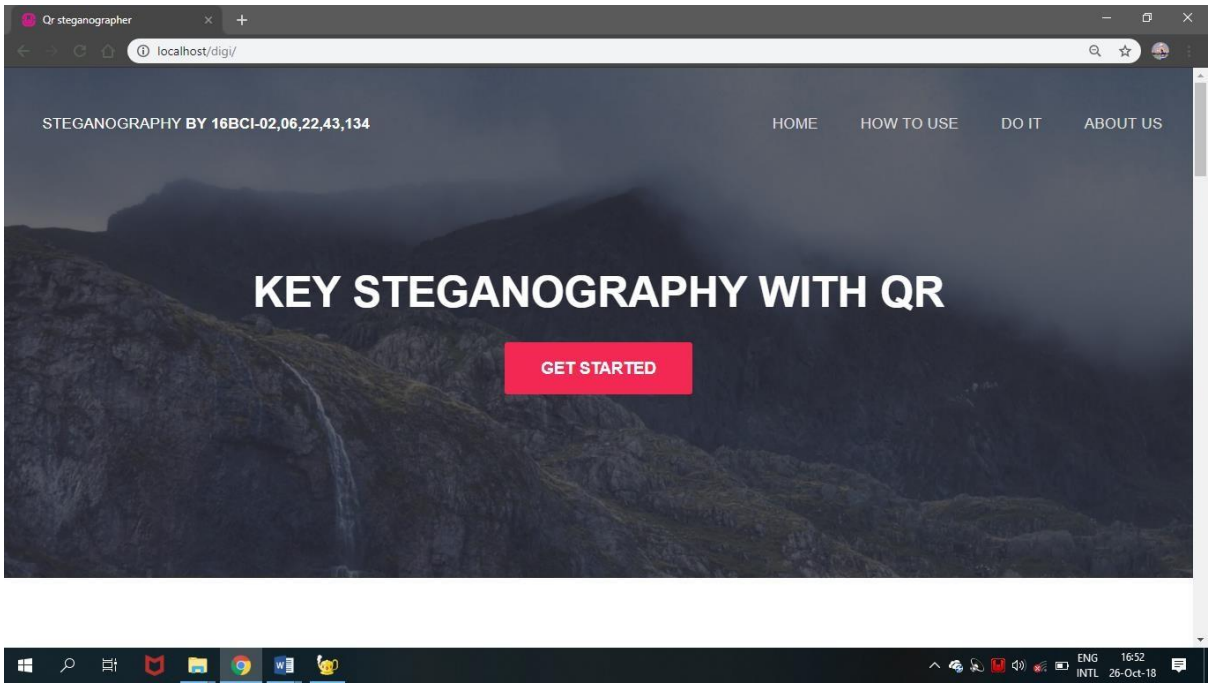
```
</header>
</form>
<?php
if(isset($_FILES['decimg']))
{
        $file_name = $_FILES['decimg']['name'];
        $file_tmp =$_FILES['decimg']['tmp_name'];
$flemvl="Decoder/".$file_name;
move_uploaded_file($file_tmp,$flemvl);
include('functions.php');
        $src = $flemvl;
        $im = imagecreatefrompng($flemvl);
        $real_message = '';
        $msg='';
        $j=0;
        $lim=getimagesize($flemvl);
        $pin=$_POST['pin'];
        $binp=toBin($pin);
        //echo "<br> Bin Pin = $binp";
        $pc=0;
        for($ih=40;$ih<$lim[1];$ih++)
        {
                for($iw=20;$iw<=$lim[0]-20;$iw++)
                {
                        if($pc>=strlen($binp))
                                $pc=0;
                        if($binp[$pc++]==1)
                        {

                                $rgb =
imagecolorat($im,$iw,$ih);
                                //echo "<br>RGB value
at ($ih,$iw) is $rgb";
                                  $r = ($rgb >>16) & 0xFF;
```

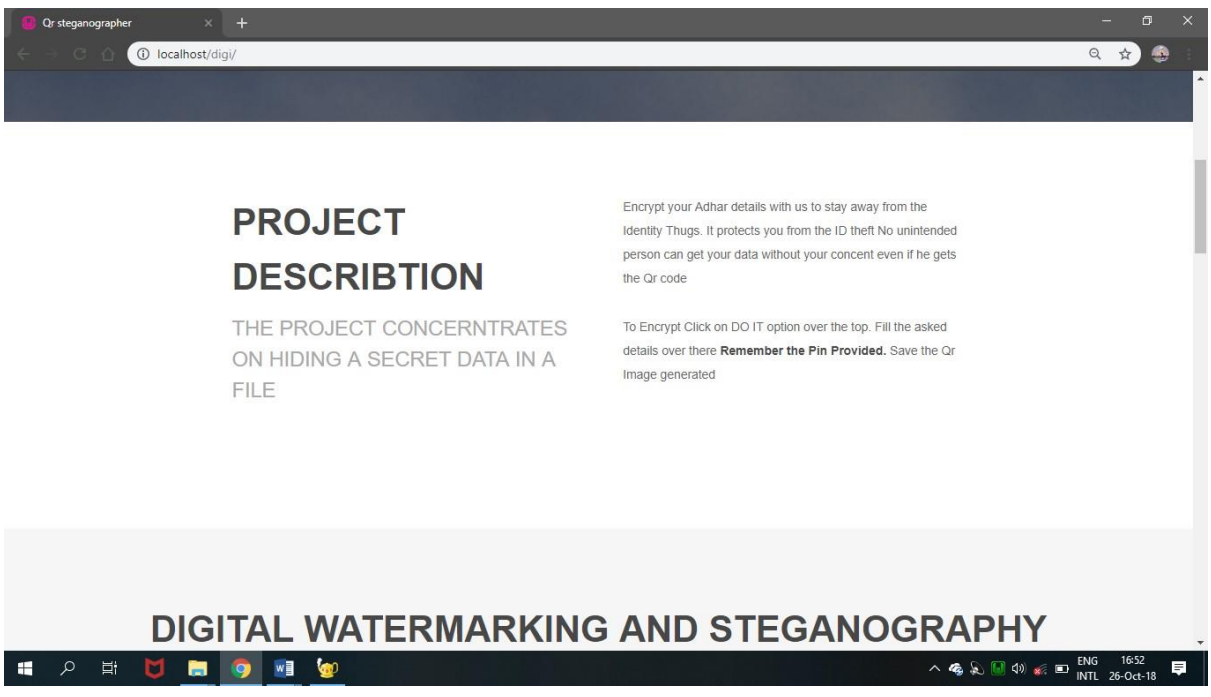
```
                                                        $g = ($rgb >>8) & 0xFF;
                                                        $b = $rgb & 0xFF;

                                                        //$blue = toBin($b);
                                                        if($j++<8)
                                                        {
                                                        //$real_message .=
$blue[strlen($blue)-1];
                                                        //$real_message.=$b;
                                                        $real_message.=$rgb;
                                                        //echo "</br> reading at
($ih,$iw) = ".$b;
                                                        //echo "</br> replacing
at ($ih,$iw) = ".$blue[strlen($blue)-1];
                                                        //echo "<br>generating
".$real_message;
                                                        }
                                                        else
                                                        {
                                                                //echo
"<br>Convert ".$real_message;
                                                                //echo
$real_message;
        $msg.=toString($real_message);
                                                                $j=1;
                                                                $real_message
= '';
        //$real_message .= $blue[strlen($blue)-1];
        $real_message.=$b;
                                                        }
                                                }
                                        }
                                }
                                //$real_message = toString($real_message);
```

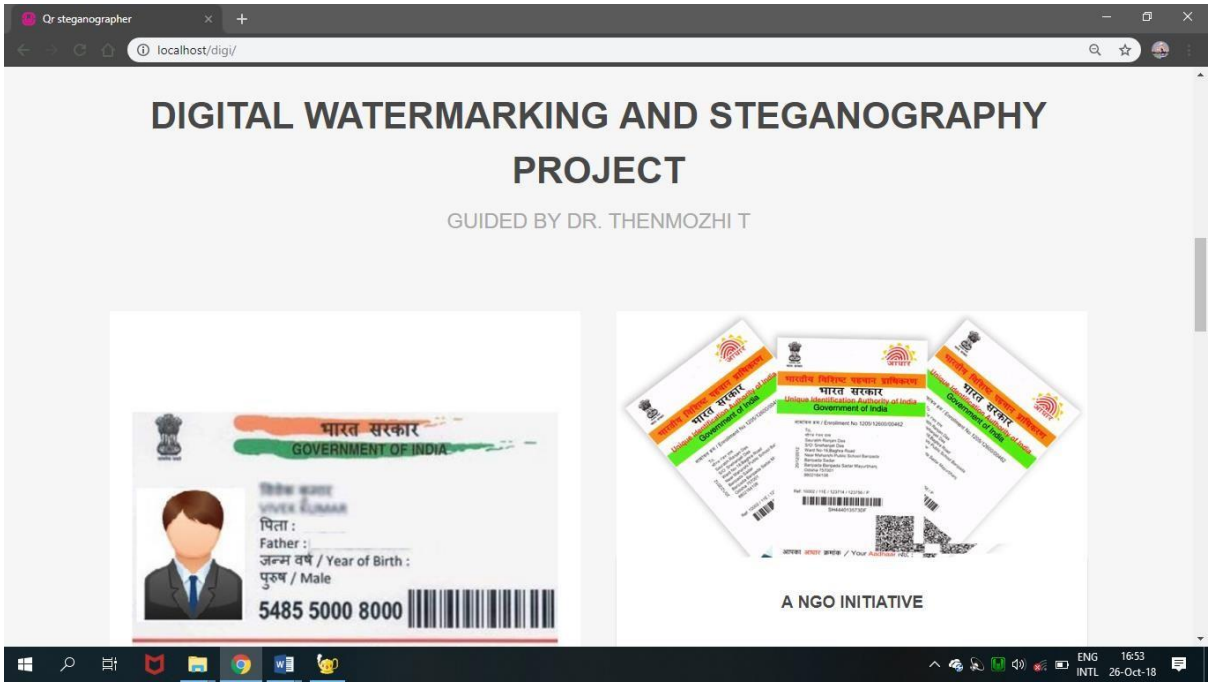
```
                                                                        //$msg=ereg_replace("[^A-Za-z0-9 ]","", $msg
);
                                                                        //$msg = preg_replace("/[^a-zA-Z0-9\s]/","  ",
$msg);
                                                                        preg_match("/[^a-zA-Z0-9\s:-
]/",$msg,$ind,PREG_OFFSET_CAPTURE);
                                                                        //print_r($ind);
                                                                        $msg=substr($msg,0,$ind[0][1]);
                                                                        echo "</br><div class=\"button special
big\">".$msg."</div>";
                                                        }
                                                        ?>
                                                </div>
                                        </section>

                <!-- Footer -->
                        <footer id="footer">
                                <div class="container">
                                        <ul class="icons">
                                                <li><a href="https://www.facebook.com/" class="icon fa-
facebook" target="_blank"></a></li>
                                                <li><a href="https://twitter.com/" class="icon fa-twitter"
target="_blank"></a></li>
                                                <li><a href="https://www.instagram.com/" class="icon fa-
instagram" target="_blank"></a></li>
                                        </ul>
                                        <ul class="copyright">
                                                <li>&copy; Rahul Ratnesh Suryansh Kartik Mayank</li></li>

                                        </ul>
                                </div>
                        </footer>

                <!-- Scripts -->
                        <script src="assets/js/jquery.min.js"></script>
                        <script src="assets/js/skel.min.js"></script>
                        <script src="assets/js/util.js"></script>
```

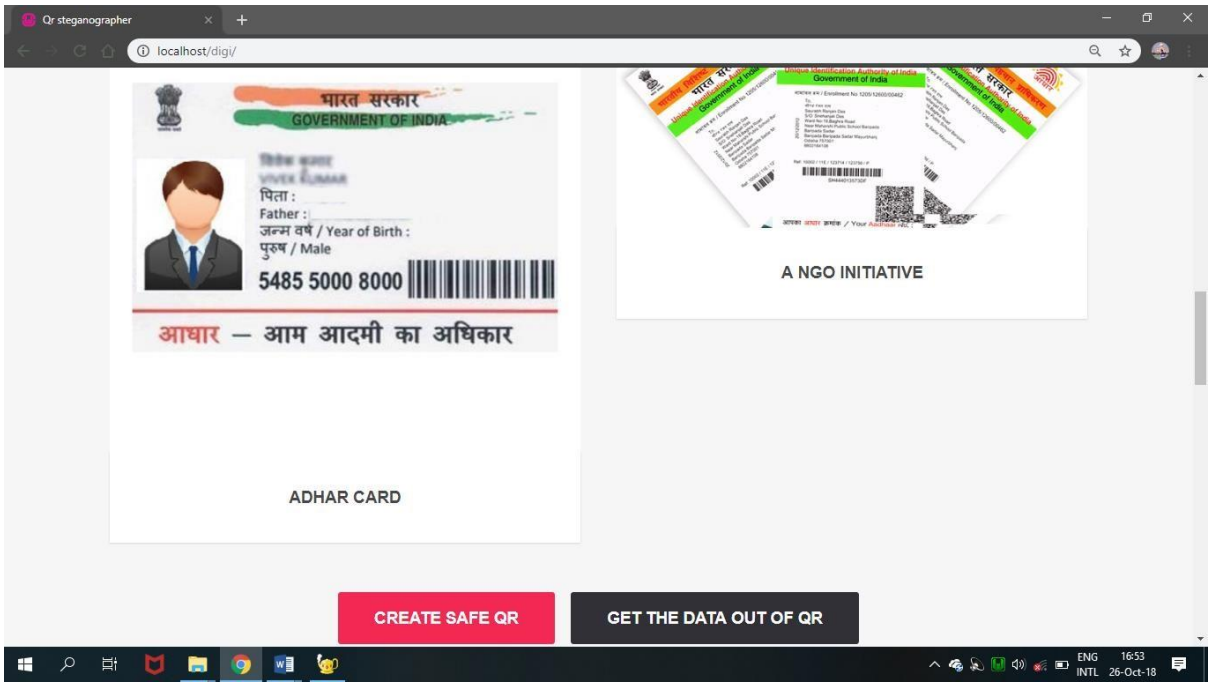
```
<script src="assets/js/main.js"></script>

</body>
</html>
```

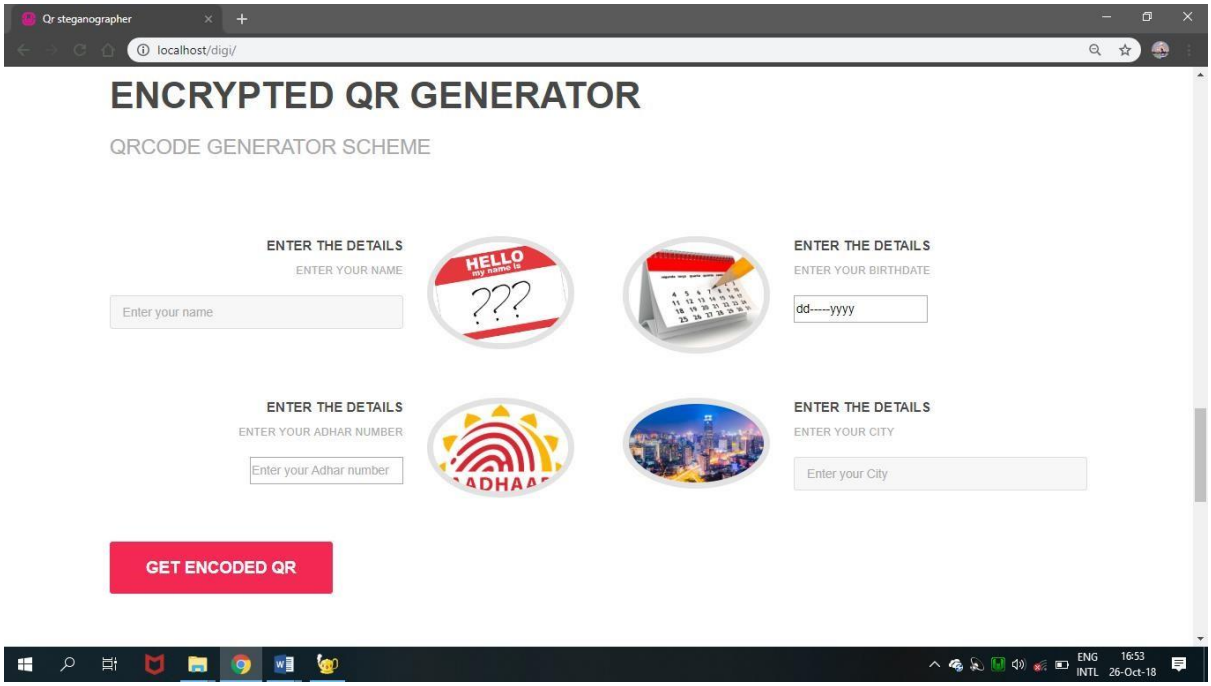
Screenshots

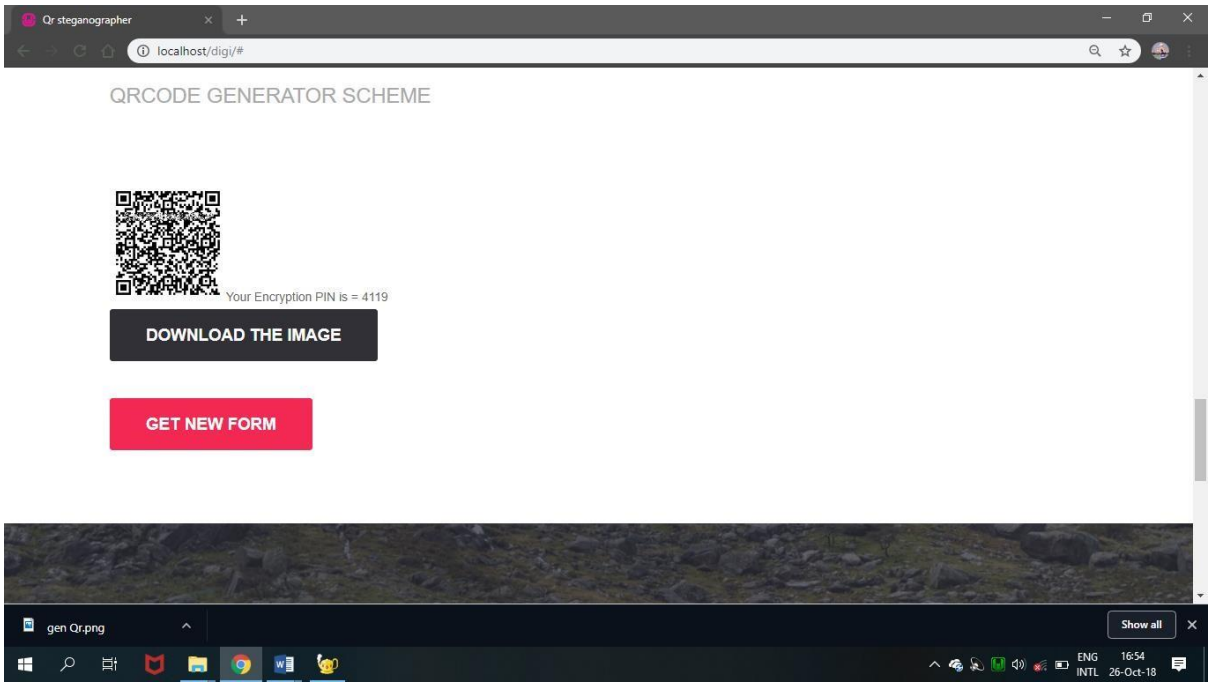


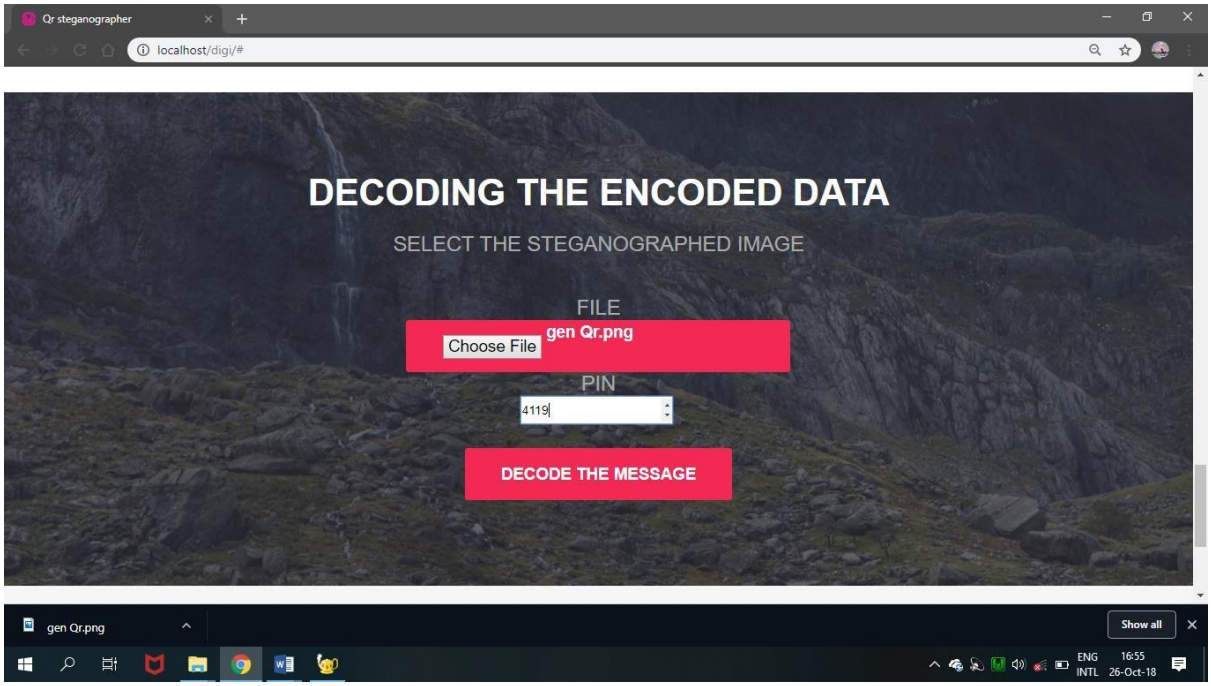


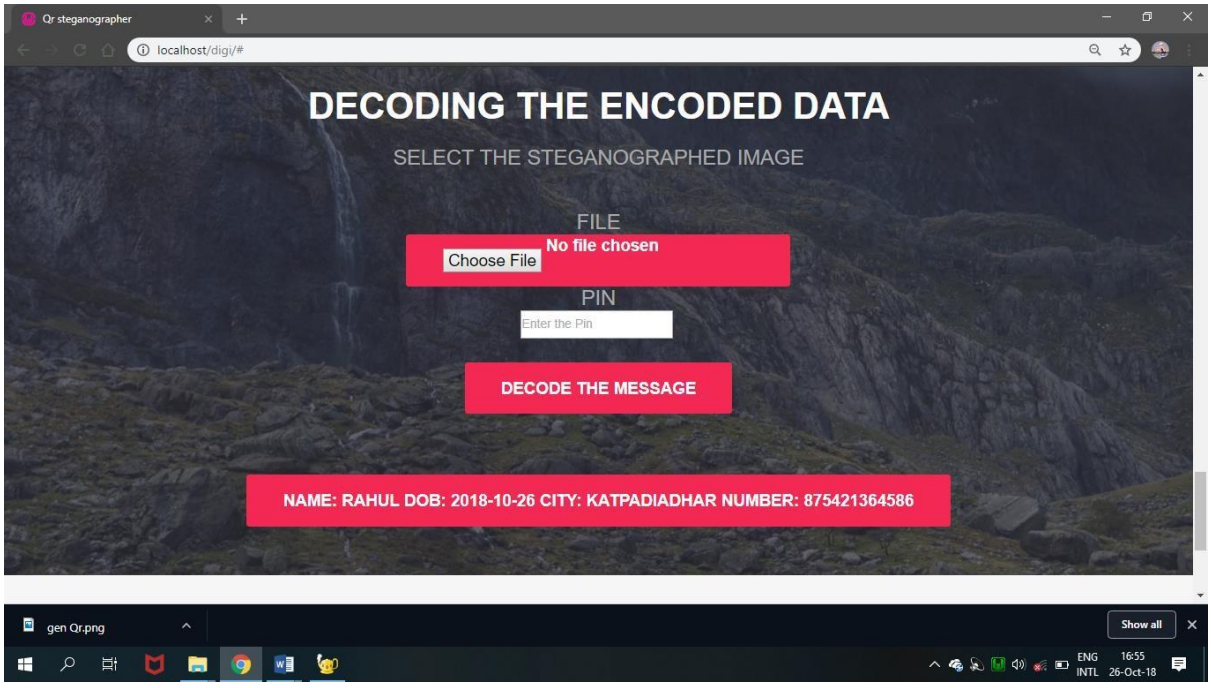

Qr steganographer
localhost/digi/
DIGITAL WATERMARKING AND STEGANOGRAPHY PROJECT
GUIDED BY DR. THENMOZHI T
भारत सरकार
GOVERNMENT OF INDIA
पिता :
Father :
जन्म वर्ष / Year of Birth :
पुरुष / Male
5485 5000 8000
A NGO INITIATIVE
ENG
INTL
16:53
26-Oct-18

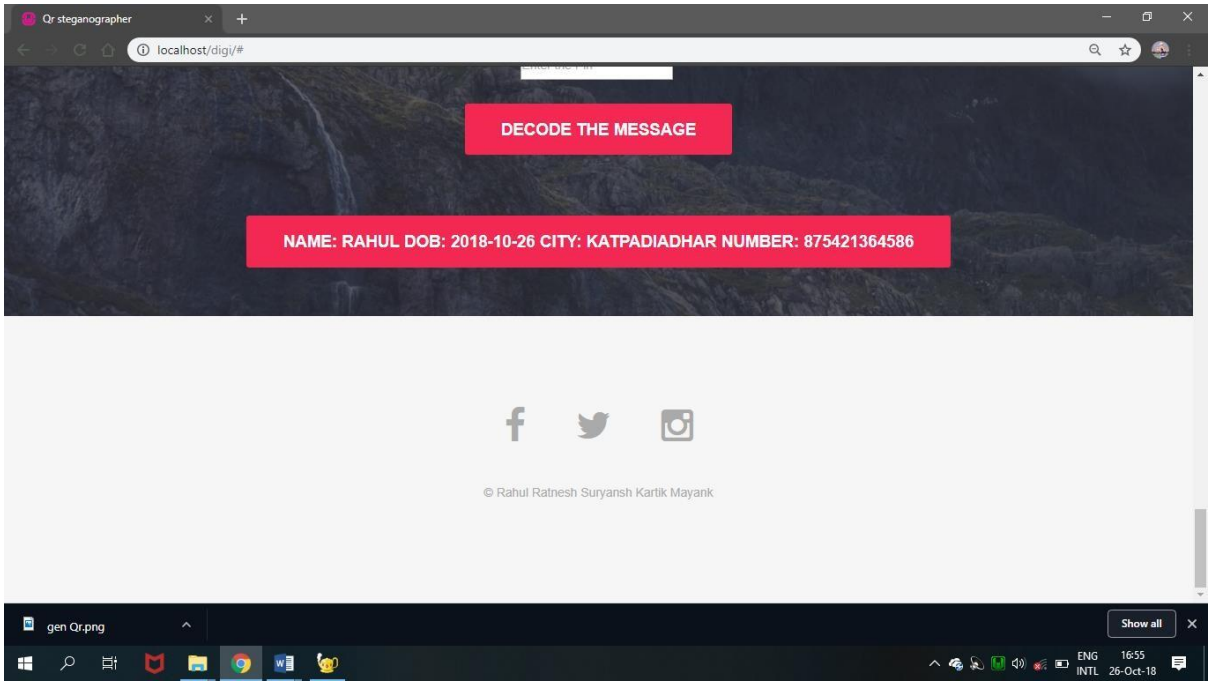

Qr steganographer
localhost/digi/
भारत सरकार
GOVERNMENT OF INDIA
पिता :
Father :
जन्म वर्ष / Year of Birth :
पुरुष / Male
5485 5000 8000
आधार — आम आदमी का अधिकार
ADHAR CARD
A NGO INITIATIVE
CREATE SAFE QR
GET THE DATA OUT OF QR
ENG
INTL
16:53
26-Oct-18


Qr steganographer
localhost/digi/
ENCRYPTED QR GENERATOR
QRCODE GENERATOR SCHEME
ENTER THE DETAILS
ENTER YOUR NAME
Enter your name
ENTER THE DETAILS
ENTER YOUR BIRTHDATE
dd-----yyyy
ENTER THE DETAILS
ENTER YOUR ADHAR NUMBER
Enter your Adhar number
ENTER THE DETAILS
ENTER YOUR CITY
Enter your City
GET ENCODED QR


Qr steganographer
localhost/digi/#
QRCODE GENERATOR SCHEME
Your Encryption PIN is = 4119
DOWNLOAD THE IMAGE
GET NEW FORM
gen Qr.png
Show all


Qr steganographer
localhost/digi/#
DECODING THE ENCODED DATA
SELECT THE STEGANOGRAPHED IMAGE
FILE
Choose File
gen Qr.png
PIN
4119
DECODE THE MESSAGE
gen Qr.png
Show all
ENG
INTL
16:55
26-Oct-18


Qr steganographer
localhost/digi/#
DECODING THE ENCODED DATA
SELECT THE STEGANOGRAPHED IMAGE
FILE
Choose File
No file chosen
PIN
Enter the Pin
DECODE THE MESSAGE
NAME: RAHUL DOB: 2018-10-26 CITY: KATPADIADHAR NUMBER: 875421364586
gen Qr.png
Show all
ENG
INTL
16:55
26-Oct-18



Conclusion

Centralizing the details of ADHAR card at one place which is secure and more feasible. Integrity of data maintained due to encryption. This method can be applied to all our important documents like passport, driving license, bank account details etc to hide it from eavesdroppers and third parties. It also can also include encryption for two-layer security.

Here we would first encrypt the data that we want to hide than hide it using steganography and send it to receiver. So, even if an eavesdropper gets hold of the hidden data he would not be able to retrieve any information sending all this information differently is quite troublesome.

Instead what we have thought is we can take a HD photo of the sender of very large pixels. So, as the pixels would be more data can be hidden in the photo and

we could make a single file of all the details of passport, aadharm, PAN etc in one file only .

References

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[4] A Survey on Various Cryptography Techniques Mitali - Vijay Kumar, Arvind Sharma, Swami Devi Dyal Group of Professional Institutions, Barwala, Distt. Panchkula, Haryana, India,