ПРИМЕНЕНИЕ QR-КОДОВ ДЛЯ АВТОМАТИЗАЦИИ УЧЕТА СПОРТИВНЫХ СОРЕВНОВАНИЙ

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APPLICATION OF QR CODES FOR SPORT COMPETITIONS' ACCOUNTING AUTOMATION

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Аннотация

Предложенный способ применения QR-кода позволяет автоматизировать и модернизировать процесс сбора, обработки и хранения информации об участнике соревнований. Данный подход позволит сократить время на прохождения мандатной комиссии участникам соревнований, а также упростить процесс обработки данных.

Abstract

The proposed method of application QR-acquisition allows to automate and modernize the process of collecting, processing and storing information about the

participant of the competition. This approach allows you to reduce time for passage of the credentials commission of the participants of the competition, as well as to simplify the data processing process.

Ключевые слова: QR-код, приложение, спортивные соревнования, бейдж участника соревнований.
Keywords: QR code, application, sport competitions, competitor badge.

QR code (QR stands for Quick Response) is the trademark for a type of two-dimensional barcode first designed for the automotive industry in Japan. A barcode is a machine-readable optical label that contains information about the item to which it is attached. Because of its fast readability and greater storage capacity compared to standard UPC barcodes The QR code system became popular outside the automotive. Also QR code can be scanned from any angle and still be able to be processed – in contrast to above-mentioned UPC [1].

It consists of black squares nestled in a square grid on a white background and can be read by any imaging device such as a camera, and processed using Reed–Solomon error correction until the image can be appropriately interpreted. The requested data is then obtained from patterns.

Figure 1. QR code

In this article we'll consider pros and cons of exploitation QR in a sport competition for a competitors' registration and their movements' monitoring throughout the event.

A relevance of this article is that nowadays sport industry in Ukraine is in need of a way to automate and modernize the process of sport competitions participants' data collection and storage.

A new element is that there is no such a case of the use of QR codes for sport competitors' data accounting. There were occurrences of the usage for consumer registration during an advertisement campaign, but not for sport.

The purpose of article is to demonstrate profitability of QR usage.

The tasks are:

1. To consider where and what for QR code is used.

2. To justify why a usage of QR does code is profitable and essential.

3. To describe technologies and tools for QR code implementation in a given area (sport).

8

Let's start with the first item.

Estimated number of QR codes created outside of Japan in 2016 is 590 million [2].

A QR code can store up to 7,089 numbers [4] and:
- Text
- Hyperlinks
- Mobile text SMS/MMS message
- Telephone number
- Email (Send message)
- Contact entry
- Calendar entry
- Program or mobile app download
- PDF or document links
- Video & Webinar links

QR code is used in such areas:
1. Promotional Materials
2. Business Cards
3. Event/Airline Tickets
4. Mobile coupons/Loyalty cards
5. Mobile Payments
6. Movie Trailers
7. Video games
8. Social Media
9. Product Info

QR code is used for:
1. URLs
2. Virtual stores
3. Website login
4. Funerary use
5. Encryption

It makes sense to use QR code in a sport for URLs, website login and promotional materials.

E.g., we can implement a competitor's ticket for each event: after user's registration for a contest, they can create link to their competitor's profile and generate QR code for a follow-on printing and wearing as a badge. These way organizers would be able to scan the badge whenever they want and check all person's information such as a name, a photo, a category, achievements, security clearance. Also this function would be accessible for other competitors and/or security.

Moreover, this is exactly how organizers could create their own badges and badges for any person like journalists or coaches. In this way we can get rid of

endless handwriting, and typing and retyping the same information during registration and checking in for competition.

The other thing – during some sports event there is check-ins along the road. Why not make it easier? A person could bring their code to a QR code scanner and get going again. Meanwhile, scanner would open a link from the code and give a signal to server that the person has checked in.

As an addition organizers should think about creating a mobile app for a security data transferring.

Now, about website login – it may have been used as an additional parameter of secured authorization. As an option, it can help to avoid typing in anything and make do only with a smartphone at hand.

Now about promotional materials. It's the easiest moment to implement because of a rich advertising history related to QR. One interesting thing about QR: one is able to change some details in a square grid without ruining the information within its structure [5]. Here are some examples (figure 2 – 3)

Figure 2. Custom QR Code: Disney

Figure 3. Custom QR Code: Nike

Such a thing would do great for a competitions advertisement for it looks unusual and aesthetically.

Let's consider all the cons for QR usage in a given area.

1) It's cheap. Almost anyone in our time has their own printer and can use it to print their badge. If else – organizers could put in practice printing all the badges centrally and hold a nominal fee for service.

2) It's simple and don't need much effort to be implement. The internet is full of services for creating QR codes with given information (a few of the post popular include Kaywa, GOQR.me, Visualead, and QR Stuff) but if one don't want to use someone else's generator they can easily write their own using any programming language.

3) It doesn't require a lot of tools. All you need is badge itself and any imaging device – and what a phone doesn't have a camera this time?

What about disadvantages:

1) Organizers have to think a lot about security for such a system operate with a load of participants' personal information which has to be treated carefully, lest it gets leaked.

2) The badges have to be protected from impact of the external environment.

So using all the above-mentioned we can imagine the way things will be changed. From simple badges (let alone handwriting registrations) like that presented on the figure 4:
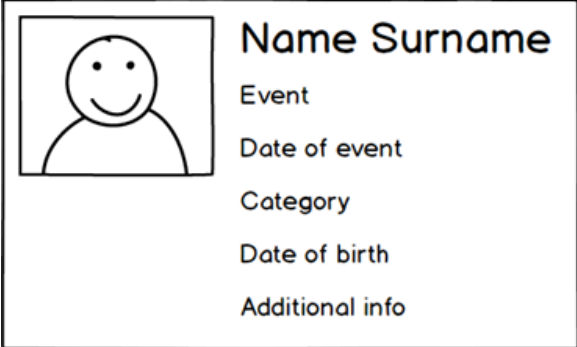

Figure 4. A usual badge

We're creating a new, simple for comprehension image (figure 5):
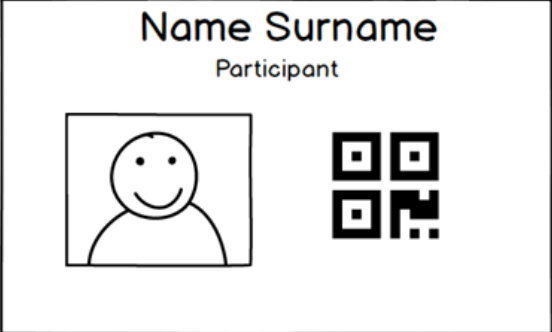

Figure 5. The competitor badge example with QR-code

After scanning the QR code, a person will be redirected to a following page (figure 6):

Figure 6. The competitor information page

If you want to create your QR Code generator, you could use a QR Code Generation API. It would do all the back-end work so you only have to deal with front-end [3]/

For example, using the Scanova QR Code Generator API, you can do the following:

- Generate 16 types of QR Code (depending upon content)
- Generate both static and dynamic QR Codes
- Create colorful and designer QR Codes
- Manage QR Codes by campaign
- Track scans and get analytics

Now we see that QR codes' advantages are really could make difference in nowadays competitions' process as they, indeed, are cheap, fast and convenient. We consider how codes work, where are they used and what for. Also we proved that usage of QR in the given area is profitable.

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