

Survey Paper on Different Bar Codes

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Types Of Bar code: Bar codes is a tag that is connected to information records. These series of characters can assign a wide range of data. As opposed to physically composing and duplicating this data, it moves toward becoming encoded in bar code dialects (symbologist) for quick exchange through a scanner to PC. Every symbology pursues a calculation for institutionalizing the encoding and putting away of these characters.

Speaking Another Language: Bar code contrast in characteristics, for example, limit and linearity, making some beneficial for specific uses and enterprises. bar code technology's innovation advances constantly. For instance, the recent surge of 2D bar coding has proven popular by allowing you to scan straight from your smart phone for a wealth of data, so following are various types of bar codes.

1D Bar code:

One dimensional bar code, likewise called 1D bar codes or straight bar codes are the first one. The parallel dark lines on the white foundation is the bar code utilized since the 1970's exclusively to store item numbers and sequential numbers for reasons for following and evaluating different items. We see these bar codes on items consistently. These are the zones which are filtered on things we purchase on puts away raise the value, making the lives of clerks that a lot simpler. Normally for this reason, an UPC bar code is utilized, by a wide margin the most well known of the linear bar codes. These 1D bar codes, called "All inclusive Product Codes", comprise of 12 numerical digits. There are more than 30 comparative 1D bar codes that perform comparable capacities as UPCs.

The United States Postal Service has a bunch of various bar codes utilized explicitly to follow bundles, called "PLANET", "POSTNET" and Intelligent Mail Bar code. Drug stores use Pharmacode, their very own special standardized tag, for imprinting on pharmaceutical items. Straight bar codes developed into various structures, which isn't astounding considering they were the standard for following items for quite a long time.

1.1 Code 39 :

This is one of the most seasoned bar codes around and is a typical symbology found in hardware, medicinal

services, and government. It is a lineal, 1D, alphanumeric code with the capacity to incorporate the whole 128 ASCII character set and reach out to any length, just constrained by the span of the label. Code 39, Code 3 of 9, USS Code 39, USD-3, Alpha39 or Type 39, this standardized tag has stayed a standout amongst the most prominent codes being used today – aside from the UPC code utilized on all retail stock.



Fig. 1: Code 39

1.2 Code 128

For Bar code based framework we need Bar code type CODE 128. In the event that space is a worry, Code 128 would be a superior decision to consider. Code 128, or Code128, was presented in 1981 as a considerably more productive option in contrast to more seasoned Bar codes like Code 11 , Code 39 , and Codabar . Unlike its forerunners, which are constrained to a subset of alphanumeric and image characters, Code 128 can be utilized to speak to the full ASCII character set (characters 0 through 127).

Code 128 is regularly alluded to as GS1-128 (once in the past UCC/EAN-128), which is a generally bolstered application standard in the transportation and bundling ventures.

Code 128 is a linear, or one-dimensional (1D) Bar code. This implies the Bar code is made out of a solitary arrangement of changing width vertical lines and spaces. The information in the Bar code is spoken to straightly by these dark/white (bar/space) patterns. Below is a basic precedent.



Fig. 2: Code 128

Every image in a Code 128 Bar code has 6 components: 3 bars (dark) and 3 spaces (white), except for the

stop image, which has 7 components (4 bars and 3 spaces). It utilizes 108 distinct images: 103 information images, 3 begin images, and 2 stop symbols. It characterizes three different character sets or character modes (128A, 128B, and 128C). Each information image speaks to an alternate character contingent upon which character set is dynamic; the underlying character mode is set by the begin character (which is the reason there are 3 diverse ones). Special images are utilized inside the information message to change to an alternate character set if needed. These changes are called shifts (switch to an alternate character set for the following image just) and latches (shift to an alternate character set for every ensuing image).

Code 128 is generally upheld, with most business Bar code scanners being fit for perusing it. Its high-thickness and ASCII 127 help make it perfect for a wide assortment uses. Its images are more perplexing to create than less competent symbolize like Code 39 (since they bolster different character sets and require a checksum), so encoding programming is regularly utilized related to specific textual styles.

Advantages of Code128:

1. Requires 6 components to encode a character, 3 bars and 3 spaces which make it conservative and succinct putting away a lot of information in little bar code, not at all like code 39 which required 9 components to encode a character.
2. Can encode all the ASCII characters (including all special characters) unlike code 39 which could encode only six special characters.
3. Gives greater security over encoded information and limited odds of a blunder while checking.
4. We require this bar code for recognizing unique ID which is in the form of numerical.

Limitation of Code128:

It has four unique widths variety for each encoded character. It is difficult to print standardized tag with four distinctive width varieties for every component.

More propelled filtering gadgets are required to check these bar codes dissimilar to code 39 which could be examined with any broad checking gadget.

Like other straight bar codes (Code39, EAN13, EAN8, I2of5, UPCA, UPCE, Coda bar, GS1 Data bar, GS1 128), code 128 is additionally exposed to twists and can be harmed effectively.

1.3 Universal Product Codes (UPC)

Found on about each retail item, these bar codes were initially made for supermarkets to give quick receipt printing and stock tracking. In the wake of verifying an UPC number, a producer will get a one of a kind organization number to join with their individual item numbers.



Fig. 3: UPC

1.4 International Article Number (EAN)

Considered a superset of the UPC, these bar codes are utilized explicitly by book retailers, libraries, colleges and wholesalers for book detectability. These 13-digit codes are made from the International Standard Book Numbers (ISBN) for each separate book followed. Like UPCs, these are institutionalized for the one of a kind distinguishing proof of distributors.



Fig. 4: EAN

1.5 PDF417:

This stacked, straight 2D standardized tag can be found in numerous sorts of distinguishing proof, for example, your driver's permit. It is additionally the picked standard by the USPS and Department of Homeland Security because of its propelled abilities, for example, encoding connects to more than one information document. Be that as it may, it very well may be broad in size – multiple times bigger than other 2D bar codes, for example, Data Matrix and QR Codes.



Fig. 5: PDF417

2D Bar code:

These bar codes are designated "Matrix" or "two-dimensional" bar codes, and they are a commendable move up to the one-dimensional bar code. 2D bar codes gloat a higher extra room and the capacity to store something beyond a bunch of numbers. Rather, the most recent adaptations can store a great many alphanumeric characters and some can even store characters from different dialects! Much increasingly

noteworthy is what number of 2D bar codes can perform different capacities like propelling applications on advanced mobile phones, a mainstream highlight of QR Codes, Microsoft Tags and JagTags. The innovation behind these 2D bar codes has been around for more than 10 years, yet ubiquity has quite recently started to flood as of late.

These codes are usually more of a square shape and use pixel-like geometric shapes, like black dots, triangles or squares encoded with data rather than parallel black lines. The most common form of these bar codes are QR codes, which let a user scan the code with their smart phone to decode the data rather than needing a special hardware scanner, like with 1D bar codes to do so. Scanning the QR code can reveal a link or message, launch a phone call, send a text message, show a map, and more. Many other 2D bar codes, like the aforementioned JagTag and Microsoft Tag perform similar functions and have also started to rise in popularity due to their own unique features.

2.1 Data Matrix:

It is a square in shape code and can encode large square – as in colossal – measures of data in a little space; it is well known in hardware assembling and medicinal services for that reason. 2D codes require modern scanners, for example, cell phones, to fundamentally “snap a photo” and interpret the whole picture at one time..



Fig. 6: Data Matrix

2.2 Quick Response (QR) Codes:

The most recent pattern in bar coding, QR Codes are picking up fame as s marketing tools to link to web-based information. Not as small as Data Matrix, you will discover them frequently utilized on publicizing materials and retail facades, connecting to unique advancements or insights regarding a specific item.



Fig. 7: QR Code

The key to the QR Code is that it tends to be perused by anybody with a Smartphone and a simple bar code reader application. The smartphone snaps a photo of this “matrix” or designed bar code, deciphers the code and demonstrates the client what data is in the bar code. On the off chance that you are in a store, you can check a sticker price on a bit of stock and discover quickly who else offers it in your general vicinity and what their costs are. Some QR codes contain a hyperlink (like our own does over) that takes the client straightforwardly to an organization's site or to a request structure page.

Uses of QR Code:

1. QR codes have turned out to be common in customer promoting. Normally, a smartphone is utilized as a QR code scanner, showing the code and changing over it to some valuable structure, (for example, a standard URL for a site, along these lines forestalling the requirement for a client to type it into a web program).
2. QR code has turned into a center of advertising strategy, since it gives an approach to get to a brand's site more rapidly than by physically entering a URL.
3. Commercial following, diversion and transport ticketing, item and steadfastness advertising and in-store item marking.
4. QR code decoder which is a portable application, or putting away an organization's data, for example, address and related data nearby its alpha-numeric content information as can be found in Yellow Pages catalogue.
5. They can likewise be utilized in putting away personal data for use by associations. An example of this is the Philippines National Bureau of Investigation (NBI) where NBI clearances presently accompany a QR code. A considerable lot of these applications target mobile-phone users (via mobile labelling).
6. Clients may get content, add a vCard contact to their gadget, open a URI, or make an e-mail or instant message subsequent to examining QR codes. They can produce and print their own QR codes for others to output and use by visiting one of a few pays or free QR code-creating destinations or apps. Google had an API, presently expostulated, to produce QR codes, and applications for filtering QR codes can be found on about all cell phone gadgets.
7. QR codes have been utilized and imprinted on train tickets in China since 2010.



Fig. 8: Train ticket with QR Code

QR codes likewise might be connected to an area to follow where a code has been filtered. Either the application that checks the QR code recovers the geo data by utilizing GPS and cell tower triangulation (GPS) or the URL encoded in the QR code itself is related with an area.

In 2008, a Japanese stonemason declared designs to imprint QR codes on headstones, enabling guests to see data about the perished, and relatives to monitor visits.

QR codes have been consolidated into cash. In 2015, the Central Bank of the Russian Federation issued a 100-rubles note to honor the annexation of Crimea by the Russian Federation.

3D Bar code

As of late assembling organizations have been attempting to execute a barcoding framework like the bar codes for buys and the retail business. The main issue is that in assembling there are high temperatures, incredibly solvents being utilized, just as an abundance of synthetic compounds and procedures that hinder the utilization of a name with bars on it. The producers need to distinguish singular parts and not simply the whole cluster as it has been accomplished for a considerable length of time. They wished to improve their stock and following framework - and have done as such using 3D bar codes.

3D bar codes utilize a similar essential rule as linear and 2D bar codes. A picture or some likeness thereof is connected to an item and after that perused by a gadget to log, classify, stock, or track an individual item. As recently expressed, the makers need a more lasting arrangement than a mark or sticker. The 3D bar code is engraved or connected to the item itself as a piece of the assembling procedure. The bars are not perused by changes in reflected light likewise with straight bar codes however by deciding the tallness of each line. The time it takes the laser to bob back and be recorded decides the stature as a component of separation and time and the character spoken to by the code can be deciphered.

The 3D bar codes are decorated on the item and the scanner perceives new characters in the string by the lower locales of the code. This works similarly as the white lines or spaces in straight bar codes. The hole enables the framework to record another stature of a line, and in this manner another number or alpha character. The 3D bar codes likewise make it almost difficult to adjust or impede the bar code's data and results in less stock mix-ups and thusly brings down working expenses of an assembling.

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