The Growing Success of 2D Technology

INTRODUCTION

Productivity is the key performance indicator of any industry and it is becoming widely accepted that barcode data collection technology is one of the best productivity investments a company can make. This has resulted in the world of data capture becoming more complex in recent years. Today, companies not only need the right data capture technology to meet the requirements of their applications, they must first decide what is the optimum technology for their business from the different symbologies that have been developed, each with a specific set of characteristics.

THE CASE FOR 2D SYMBOLOGIES

There are two main factors to be considered when choosing a symbology.

First, a business must consider whether they need to adopt a particular symbology to comply with an existing industry or organisation standard. The second factor is the type and amount of data that needs to be encoded.

Nowadays, the growing amount of information needed to be encoded in both traditional and emerging market applications is driving the success of 2D symbology. Two-Dimensional (2D) symbologies encode data in both the height and width of the symbol, and the amount of data that can be contained in a single code is significantly greater than that stored in a one dimensional barcode.

Two-dimensional symbologies represent one of the biggest advances in the market of Automated Data Collection in the past few years. With advances in technology, and with smaller and faster micro-processors, 2D readers can vastly improve the ratio between costs and benefits provided.

Initially, two-dimensional symbologies were developed for applications where only a small amount of space was available for a barcode. The first application was for unit-dose packages in the healthcare industry. These packages were small and had very little room for a barcode. The electronics industry also showed an early interest in very high density barcodes and two-dimensional symbologies because free space on electronics assemblies was scarce. More recently, the ability to encode a portable database has made two-dimensional symbologies attractive in other applications where space is limited.

Another beneficial aspect of two-dimensional symbologies is their added durability. With conventional 1D symbologies, the inclusion of another bar to the beginning or end of the barcode, a line going through the code or parallel to the stripes all make the barcode unreadable by confusing the checks and a balance built into the decoding algorithms.

By comparison, many degrees of protection can be built into a 2D symbol making it remarkably secure and robust, even if accidentally damaged.

EMERGING APPLICATIONS

2D readers are now becoming widely used in applications traditionally based on linear codes, adding the advantage of omni-directional scanning. Independent market research (VDC) forecasts that, in addition to the strong growth expected for 2D readers in the industrial sectors, new emerging retail applications traditionally using linear codes, are moving towards 2D.

Below are some examples of emerging 2D target markets:

Document Handling - Tax Returns

Tax returns must be filed in every nation around the world. To simplify the filing process, taxpayers could use tax software that allows them to enter the relevant data, performs the required calculations and, when complete, can print the form out with a 2D code.
The following benefits will result: When the form arrives at the tax authority, the data can be captured by scanning the 2D code which takes seconds. The data is not only captured quickly, it is captured with 100% accuracy - no errors are introduced by the scanning process. Not only is the direct cost of paying someone to key the data eliminated, but the indirect costs, to both taxpayers and the government, of the errors introduced by manual key entry are eliminated (studies show that professional key entry can result in up to 1 error every 300 key strokes).

This application also has potential outside the income tax arena. In fact any situation in which companies or individuals are supplying information to a government or organisation in paper form could benefit from this type of application. This includes company excise/sales tax returns, the submission of company employment information, and the collection of government economic statistics from business enterprises, among others.
By simply adding a 2D code to a form, you create what is, in effect, an "intelligent document", one that can be read by human beings, but that can also be automatically and accurately entered into a computer whenever required.

Document Handling - Driver's Licence/Insurances/Lotteries

Personal information such as the driver's name, address, licence number, expiry date and driving restriction codes can be encoded in a 2D symbol that is printed on the operator's licence. Police officers, car rental agencies, hotels etc. can easily enter information regarding the licence holder, without the possibility of any inputting errors. The same concept can apply to any application requiring fast and secure automatic data entry (i.e. insurance, lotteries).

Transportation and Logistics - Packing List

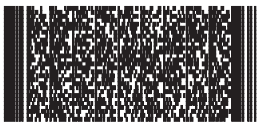
By encoding shipping information in a 2D symbology and attaching it to a shipped good, order data (PO number, shipping date, product codes, quantities, etc.) can automatically be entered into the receiver's computer at goods receiving, in just a few seconds.

Healthcare - Patient Record

On a hospital patient's chart record there is a 2D symbology, encoding their name, health care number, doctor's name, date of admission, allergies, etc.
When treatment or checks are given to the patient, the nurse or doctor records the action by scanning the code. The code is also is scanned when medication is administered virtually eliminating the possibility of giving a patient the wrong treatment.

MOST COMMON 2D SYMBOLOGIES

2D Stacked



PDF417 is a high-capacity two dimensional code. A PDF417 code can hold approximately 2000 characters of information, whereas a traditional linear code has difficulty holding more than 30 characters. The key characteristic of PDF417 is its large information capacity. This also explains its name. "PDF" stands for Portable Data File. PDF417 is designed with enough capacity to contain an entire data file of information. With traditional linear codes, the barcode contains only a key or "license plate". With PDF417, no external database access is needed, because the PDF417 code can hold all the information needed an entire portable data file. PDF417 is used today in a wide variety of applications, including logistics & transportation, retailing, healthcare, government, identification, and manufacturing.

2D Matrix

DataMatrix is a two-dimensional code that can store up to 2,000 characters. The symbol is square and can range from 0.001cm per side up to 36 cm per side. DataMatrix is being used to encode product and serial number information on electrical rating plates; to mark surgical instruments in Japan; to identify lenses, circuit boards, and other items during manufacturing.

MaxiCode is a fixed-size code that holds up to 93 data characters. The symbol is composed of a central bulls-eye locator and offset rows of hexagonal elements. Created by United Parcel Service (UPS), the MaxiCode symbol was designed for quick automated scanning of packages on high-speed conveyor lines (special cameras can read a MaxiCode on a carton travelling at up to 150 metres per minute).

The **QR Code** (Quick Response Code) can encode up to 2509 numeric or 1520 alphanumeric characters and offers three levels of error detection. The smallest QR Code measures 21 X 21 cells (each cell encodes one bit) and can grow in increments of 4 cells to a maximum size of 105 X 105 cells. The squares in the bottom left, top left, and top right corners are locator patterns.

DATALOGIC'S COMMITMENT TO 2D TECHNOLOGY

Datalogic is the only company in the AIDC arena offering a range of dedicated 2D products for retail and industrial applications.

The **Lynx™ D432/D432E** is Datalogic's third generation 2D industrial imager and the first powered with the new X-Scale microcontroller. It consolidates Datalogic's strength in 2D-CMOS readers and further enhances our offering for 2D scanning and image capture applications.

The **Lynx™ BT** frees the operator with Bluetooth wireless connectivity making it ideal for applications where operators need to move around to scan codes. These include most shop floor, warehouse management and parcel sorting applications as well as postal environments, where the operator needs to move freely around the work place without having to worry about a twisted and/or entangled cable.

The **Gryphon™ D432/D432E** is the latest Datalogic 2D-CMOS hand-held reader for retail applications, and is based on the latest generation of Intel's microcontroller. Like the Lynx™, it supports image capture. Provided in both standard and high resolution versions, the Gryphon™ D432 is the perfect combination of the outstanding reading performance of the Lynx™ and the unmistakable design & distinctive features of the Gryphon™.

DATALOGIC™

Datalogic Scanning, Inc.
Toll free: 1 800 695 5700
International: 1 541 683 5700
E-mail us at: scanning@datalogic.com
www.scanning.datalogic.com

R40-0245-UK-A 0307