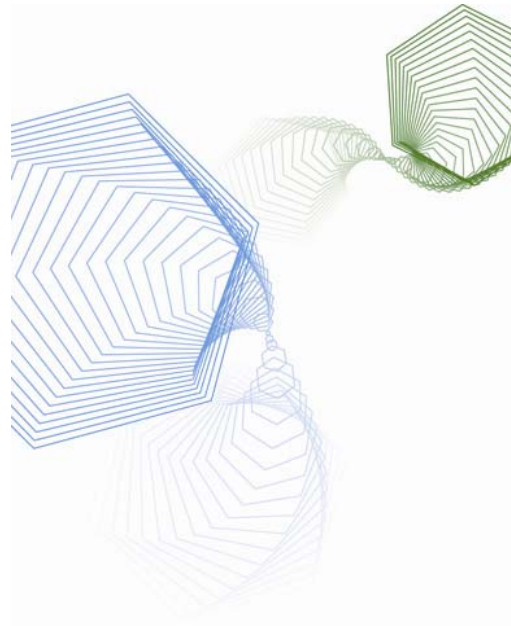


# Best Practices of **Adobe LiveCycle** **Barcoded Forms** and PDF417 Barcodes

Lee Sutton

Senior Systems Architect

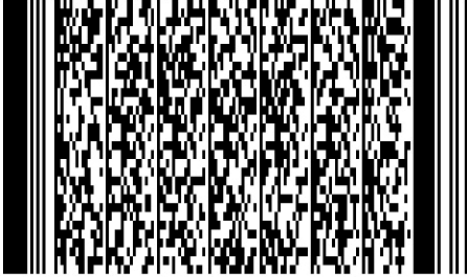


## Agenda

- **An Introduction to PDF417**
- **Anatomy & Terminology**
- **Error Correction “Costs”**
- **Encoding & Capacity**
- **Best Practices**
- **Samples**

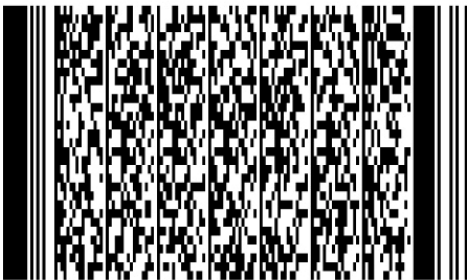


## Introduction to PDF417



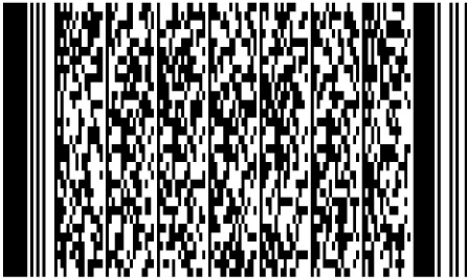
- PDF stands for Portable Data File.
- **The PDF417 format was developed by Symbol Technologies.**
- Two-dimensional “stacked” bar code symbology.
- **More than just an index to reference a database**
- More storage of data than 1D barcodes.
- **PDF417 barcodes can store up to 2710 characters?**

## Introduction to PDF417



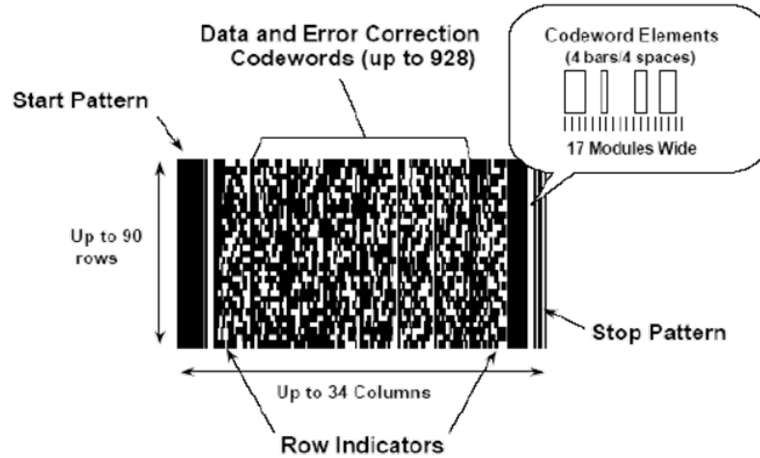
- **The PDF417 code can correct damage including writing, smudges, fax problems with a configurable amount of error correction.**
- Several schemes (compaction methods) are defined for representation of certain types of data within the Barcode.
- **Using PDF417 instead of a 1D Barcode is not significantly slower.**

## Introduction to PDF417

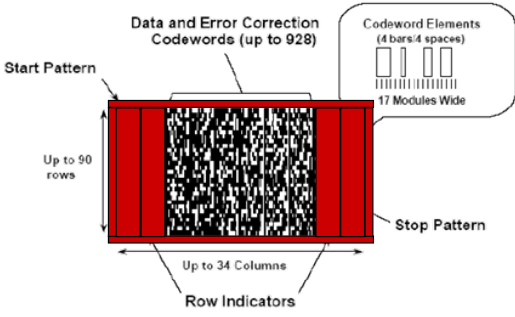


- Does not need to read in an exactly horizontal pattern.
- Can be scanned from either the top or the bottom equally easily.
- **Public domain format.** Anyone can implement without any license.

## PDF417 Anatomy



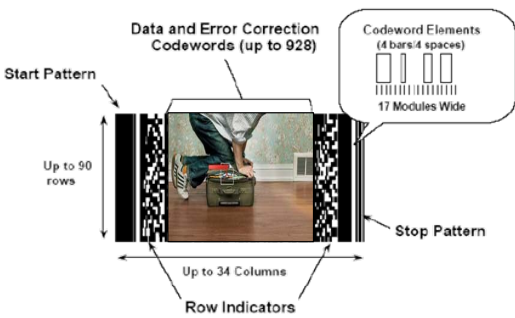
## PDF417 Anatomy – Terminology Overview



The diagram illustrates the layout of a PDF417 barcode. It features a central data region flanked by Start and Stop patterns. The data region is composed of Data and Error Correction Codewords, which are up to 928 in total. The barcode is up to 90 rows high and up to 34 columns wide. Row Indicators are located at the bottom of the data region. A callout box shows Codeword Elements, which are 4 bars and 4 spaces wide, and are 17 modules wide.

- Quiet Zones
- Start Pattern
- Left Indicator
- Data Region
- Right Indicator
- Stop Pattern

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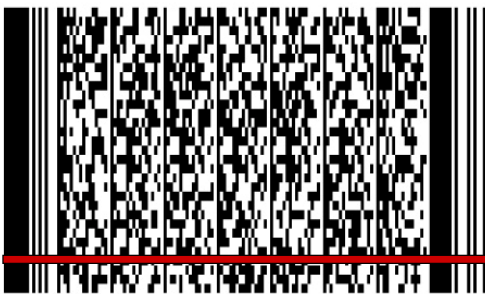
- Quiet Zones
- Start Pattern
- Left Indicator
- Data Region
- Right Indicator
- Stop Pattern

## PDF417 Anatomy – Terminology - Module



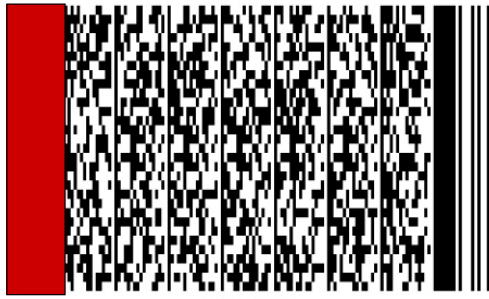
- **Module**
- **Row**
- **Column**
- **Code Word**

## PDF417 Anatomy – Terminology - Module



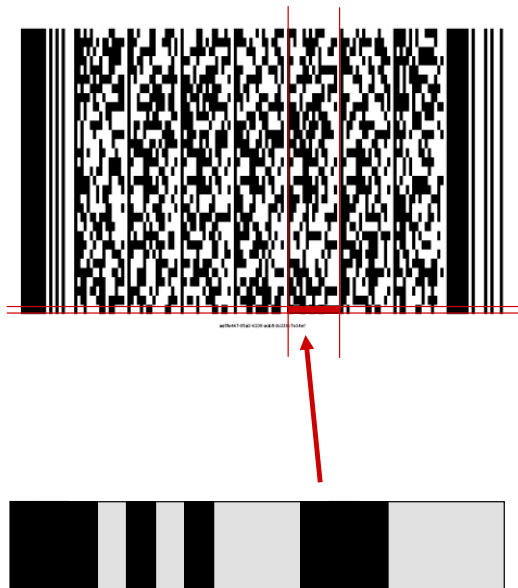
- **Module**
- **Row**
- **Column**
- **Code Word**

## PDF417 Anatomy – Terminology - Module



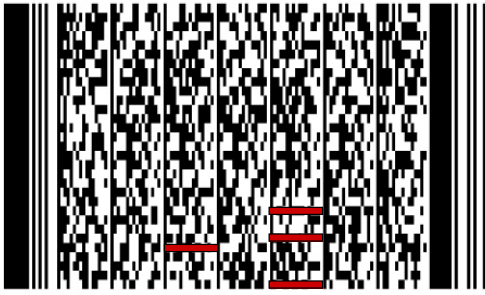
- **Module**
- **Row**
- **Column**
- **Code Word**

## PDF417 Anatomy – Terminology - Module



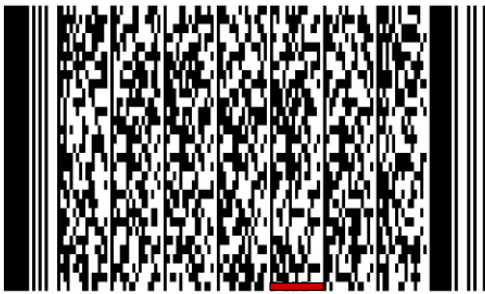
- **Row**
- **Column**
- **Module**
- **Code Word**

## PDF417 Anatomy – Terminology - Module



- Row
- Column
- Module
- **Code Word**

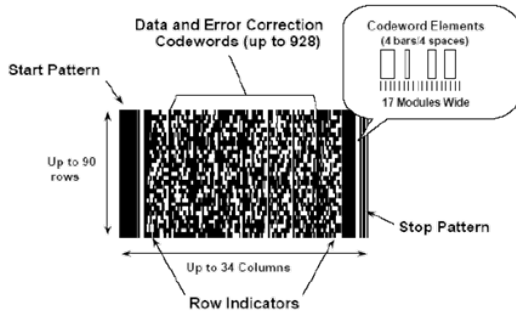
## PDF417 Anatomy – Terminology – Code Word



- 17 Modules
- 4 Module sections “blacked out”

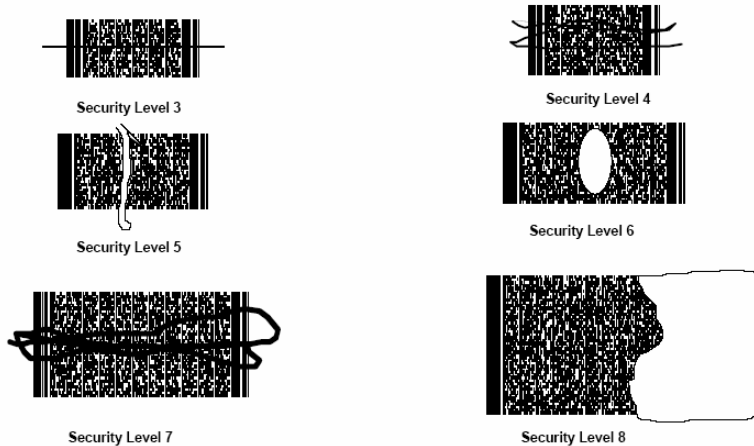
- Each code word is made up of 17 modules containing 4 bars and 4 spaces
- Start by a bar
- Bar and space width is 1 to 6 modules.

## PDF417 Anatomy – Terminology - Sizing



- Composed of 3 to 90 rows
- 1 to 30 data columns
- **Maximum of 928 code words**
- 1 code word as a length descriptor
- At least 2 for error correction
  
- Reader 7.0.5 Auto-Corrects Design Issues
- Versions Below 7.0.5 will NOT Auto-Correct Design Issues

## PDF417 Anatomy – Terminology – Error Correction



- The errors correction levels goes from 0 to 8

## PDF417 Anatomy – Terminology – Error Correction

Security Level 3

Security Level 4

Security Level 5

Security Level 6

Security Level 7

Security Level 8

- **Level and Possible Code Words Required**
  - **0 - 2**
  - **1 - 4**
  - **2 - 8**
  - **3 - 16**
  - **4 - 32**
  - **5 - 64**
  - **6 - 128**
  - **7 - 256**
  - **8 - 512**

## PDF417 Anatomy – High Level Encoding

Data and Error Correction Codewords (up to 928)

Codeword Elements (4 bars/4 spaces)

17 Modules Wide

Start Pattern

Up to 90 rows

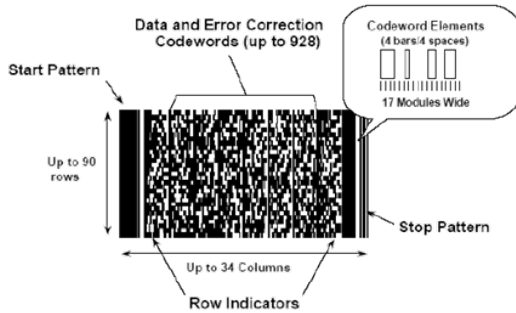
Up to 34 Columns

Row Indicators

Stop Pattern

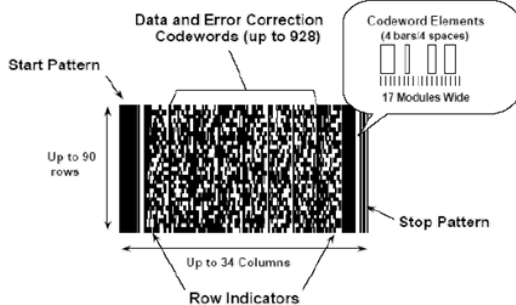
- **Convert all data into a numeric representation**
- **Convert those numeric representations into “Code Words”**
- **Apply Error Correction Algorithm**
- **Place “Code Words” into a readable Barcode**

## PDF417 Anatomy – High Level Encoding



- **Data being encoded?**
- **Compaction mode?**
- **"Byte"**
  - **ASCII 0 to 255 (entire table)**
  - **1.2 byte per code word**
- **"Text"**
  - **ASCII 9, 10, 13 & 32 to 127**
  - **2 characters per code word**
- **"Numeric"**
  - **Only digits 0 to 9**
  - **2.9 digits per CW**
- **Default mode is "Text" mode.**

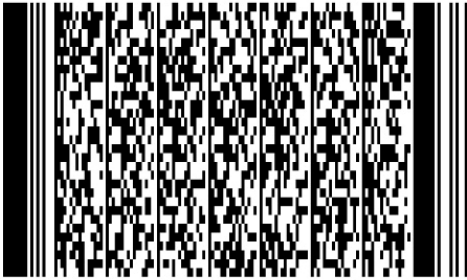
## PDF417 Anatomy – High Level Encoding – Text Mode



- **"Text" mode has 4 sub-modes**
  - **Uppercase**
  - **Lowercase**
  - **Mixed : Numeric and punctuation**
  - **Punctuation**

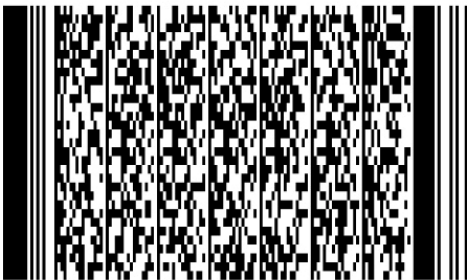


## PDF417 Content Best Practices



- **Identifiers**
  - **Form Identification**
    - **“MYForm”**
  - **Barcode Identifier**
    - **“B1OF1”**
  - **Page Number**
  - **Total Pages in Document**
    - **“P1OF2”**
  - **Date & Time (optional)**
- **Form Content**

## PDF417 Forms Content Best Practices

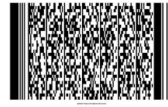


- **Notify user that this is a fill and print PDF form**
- **Possibly educate them on what the barcode is for**
- **Prevent printing if form is incomplete**

## PDF417 Best Practices



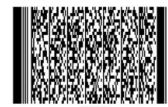
- **Be certain all fields have a maximum length or value**



- **Use decoder to create XML not Reader or Acrobat**



- **Test your forms with all data combinations**



- **3 to 90 rows**
- **1 to 34 columns**
- **928 code words**
- **Reader 7.0.5 -/+**

## PDF417 Best Practices



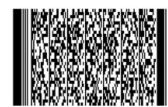
- **Increase Width Before Height**



- **Use Adobe defined error corrections**

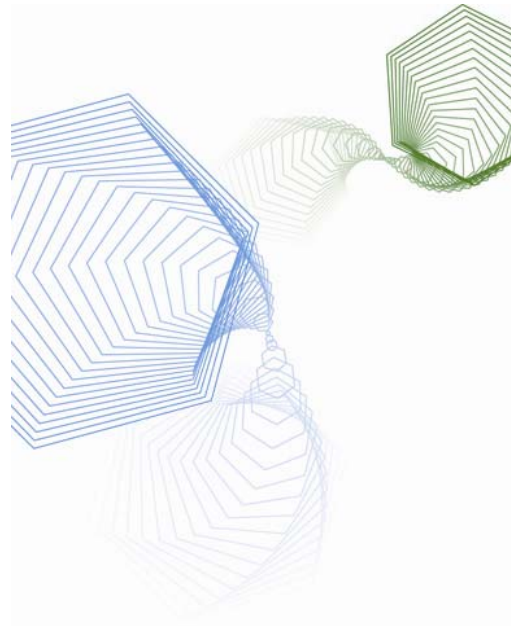


- **Data makes all the difference**



- **Encoder / Decoder Compression**

# Questions?



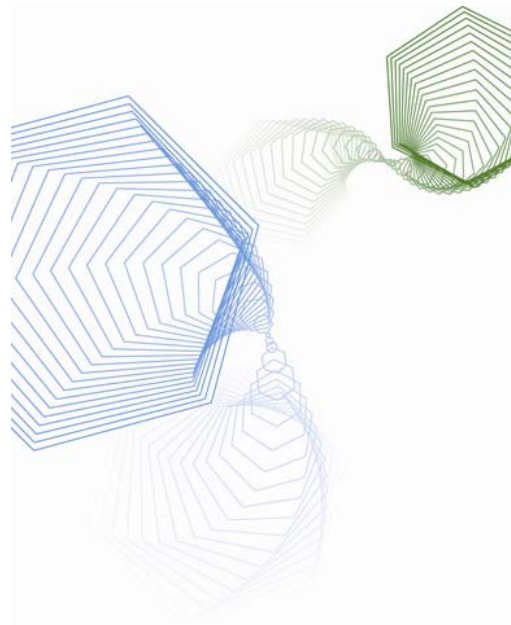
# Thank You

Lee Sutton [lsutton@adobe.com](mailto:lsutton@adobe.com)

Senior Solutions Architect

Tel.: 1-800-866-8006 ext. 53840

+1-514-366-0249



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