



DEMYSTIFYING THE ASCII X12 TRANSACTION SET

Practical Information Archeology for the Medicaid Project Manager

Copyright © 2024. Colin E. Beech, PhD.



BACKGROUND

- Businesses of all kinds are constantly sharing information.
- With the advent of early networked computing, most computerized interactions were done with dumb terminals or teletype interfaces, and eventually, personal workstations connected via modems, etc.
- Collectively, a common standard way to share information over these networks was needed for business purposes;
- The [X12](#) Messaging standard, defined by IBM and a variety of other industry partners in 1981, created a common vocabulary of data explicitly for sharing over **Electronic Data Interchanges**, or EDI's
- Prescient in its' design, X12 messages contain metadata about their contained data, especially noting the sender and receiver; TCP/IP packets, the foundation of modern web computing, perform the same way.

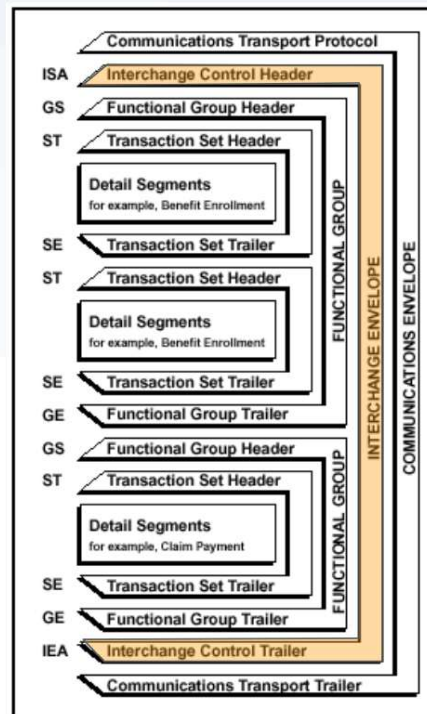
THE HIPAA REVOLUTION



- The Health Insurance industry was one of the earliest and remains as one of the most prolific adopters of the ANSI X12 standard, helping to make healthcare-related data 'portable' yet secure.
- Congress's creation and President Clinton's signing into law of HIPAA in 1996 led to its widespread adoption.
- Various incarnations of this standardized language have been adopted over the years, with **HIPAA 5010** as the current adopted industry standard
- **Every** provider, insurer, MCO, nursing facility, pharmacy, and all sorts of other entities all rely on this common standard to connect a vast network of health insurance-related data exchange.
- **Medicaid** is one of the major consumers and proponents of the X12 HIPAA messaging standard

X12 ANATOMY

- The X12 standard is one of the earliest examples of *structured data*, with broad yet specific syntax rules defining their structure.
- While the structure might look intimidating, it's regulated pattern of communication make it far easier, predictable, and reliable than programming tailor-made interfaces on demand.
- The HIPAA 5010 X12 Transaction Set is the best way to get familiar with X12.



```

ISA*00*          *00*          *ZZ*ODF_BUYER
*ZZ*ODF_SUPPLIER
*200828*0932*U*0040*001234321*~
GS*PO*ODF_BUYER*ODF_SUPPLIER*20200828*0
932*1234321*X*004010~
ST*850*0001~
BEG*00*SA*PO123456789**20200828~
REF*DP*210~
DTM*002*20200910~
DTM*010*20200905~
N1*BT*ODF_BUYER HQ~
N3*1119 BUSH STREET~
N4*SAN FRANCISCO*CA*94101~
N1*ST*ODF_BUYER MAIN STORE~
N3*1207 WASHINGTON RD~
N4*SEATTLE*WA*98101~
PO1*1*48*CA*26.25**UP*711719100246*VN*00
9~
PID*F***SUNGLASSES VERMILLION (E16249)~
PO1*2*120*CA*27.45**UP*611719100245*VN*0
09A~
PID*F***SUNGLASSES YELLOW (F8C729)~
CTT*2~
SE*17*0001~
GE*1*1234321~
IEA*001234321~
  
```

'HELLO, WORLD'

- A fine tradition in computer science has junior programmers writing a program that displays, “Hello, world” on the screen, or before there were screens, on a printer.
- In the X12 world, this would likely be the ‘270/271’
- A 270, like the one on the right, essentially has one computer asking another, “Is Jane Doe covered under your health insurance plan?”
- The response, a 271, sends back a “Yes” with dates of coverage, or a “No”

```
ISA*01*0000000000*01*0000000000*ZZ*ABCDEFGHIJK  
LMNO*ZZ*123456789012345*101127*1719*U*00400*  
000003438*0*P*>  
GS*HS*4405197800*999999999*20120117*1719*1421  
*X*004010VICS  
ST*270*1234  
BHT*0022*13*1*20010820*1330  
HL*1**20*1  
NM1*PR*2*****PI*123456789  
HL*2*1*21*1  
NM1*1P*2*****SV*987654321  
HL*3*2*22*0  
NM1*IL*1*DOE*JANE****MI*345678901  
EQ*30**FAM  
SE*10*1234  
GE*1*1421  
IEA*1*000006768
```

MAIN HIPAA 5010 X12 ACTIONS

- These are common X12 HIPAA 5010 transactions commonly seen in Medicaid:

EDI Transaction	Business Application
271	Healthcare Eligibility Benefit Response, used to indicate if a member is covered.
277	Healthcare Claim Status; has a claim been paid, or is it suspended?
278	Prior Authorization; notes when a claim has previously been approved, like insulin for Type 1 Diabetes patients (all defined in the ICD-10 Diagnostic Standards)
832	Claims Payment/Remittance Advice; indicates a structural flaw with a claim that, if fixed, will result in payment processing.
834	Benefit Enrollment Transaction; used to enroll/disenroll members from a Health plan.
835	Healthcare Claim Payment/Remittance; <i>frequently</i> used, the basic package for a healthcare claims payment to a provider after an encounter with a plan member .
837	Healthcare Claim Transaction Set, a broader vehicle for transmitting healthcare claim information and data

THE WEB ERA

- Many other X12 transaction types exist, both within and without HIPAA 5010; the business world revolved around their use well before the internet existed and entered common use.
- “Flat files” of X12 encoded data were often shared overnight to perform bulk processing prior to the ‘Amazon/Facebook’ era.
- As web-based computing became standard, rather than simply discard the X12 HIPAA 5010 standard, modern messaging layers have simply adopted its use.
- Contemporary web applications now *emulate* the X12 standard from the previous era over modern networks, in real-time, usually as JSON or XML data shared via API endpoints, “the web way” you use everyday at work and home.

The screenshot displays the 'EDI JSON' interface of the 'edi json' application. At the top, there are tabs for 'EDI TRANSLATOR', 'EDI JSON' (which is selected), and 'EDI ACK'. The 'EDI JSON' tab contains a sub-header 'EDI Data' with a circular icon, and buttons for '<> JSON', 'Validate', and a download icon. On the right side of the interface, there is a red-bordered box containing an 'Update EDI' button and another download icon. The main area is split into two panels. The left panel shows X12 EDI data with line numbers 1 through 20. The right panel shows the corresponding JSON structure, with line numbers 1 through 25. The JSON structure includes fields like 'SegmentDelimiter', 'DataElementDelimiter', 'ISA', 'AuthorizationInformation', 'SecurityInformation', 'SenderIDQualifier', 'InterchangeSenderID', 'ReceiverIDQualifier', 'InterchangeReceiverID', 'InterchangeDate', 'InterchangeTime', 'InterchangeControlStandard', 'InterchangeControlVersion', 'InterchangeControlNumber', 'AcknowledgementRequested', 'UsageIndicator', and 'ComponentElementSeparator'.

```
1 ISA*00*.....*00*.....*14*SI
2 GS*IN*SENDER1*RECEIVER1*210929*1422*
3 ST*850*000000001~
4 BEG*00*SA*XX-1234**20170301**NA~
5 PER*BD*ED-SMITH*TE*8001234567~
6 TAX*53247765*SP*CA*****9~
7 N1*BY*ABC-AEROSPACE*9*1234567890101~
8 N2*AIRCRAFT-DIVISION~
9 N3*2000-JET-BLVD~
10 N4*FIGHTER-TOWN*CA*98898~
11 PO1*1*25*EA*36*PE*MG*XYZ-1234~
12 MEA*WT*WT*10*OZ~
13 IT8*****B0~
14 SCH*25*EA***106*20170615~
15 CTT*1~
16 AMT*TT*900~
17 SE*15*000000001~
18 GE*1*000000001~
19 IEA*1*000000001~
20

1 {
2   {
3     "SegmentDelimiter": "~",
4     "DataElementDelimiter": "*",
5     "ISA": {
6       "AuthorizationInformationQua
7       "AuthorizationInformation_2"
8       "SecurityInformationQualifi
9       "SecurityInformation_4": "
10      "SenderIDQualifier_5": "14"
11      "InterchangeSenderID_6": "SI
12      "ReceiverIDQualifier_7": "1
13      "InterchangeReceiverID_8": "
14      "InterchangeDate_9": "21092
15      "InterchangeTime_10": "1422"
16      "InterchangeControlStandard:
17      "InterchangeControlVersionNi
18      "InterchangeControlNumber_1
19      "AcknowledgementRequested_1
20      "UsageIndicator_15": "T",
21      "ComponentElementSeparator_
22    },
23    "Groups": {
24      {
25        "GS": {
```



LEARNING MORE

- CMS, the Center for Medicaid and Medicare Services has a special group that focuses on nothing but the Medicaid EDI transaction set, [CAQH CORE](#); I used to consult for them.
- Health and Human Services has a great overview [here](#).
- **Fun Fact:** The CMS 270/271 service that allows entities from all over the United States (& beyond) to see if an individual has Medicaid coverage handles so much traffic that it is broken into 270/271 East, and 270/271 West nationally.
 - ❖ The actual server locations are Top Secret.
 - ❖ If one service went down due to disaster/military attack, the other can operate redundantly until an alternate is brought back online.