Electronic Case Reporting Data Validation and Quality Assurance in Connecticut in 2023: Use of PowerShell, XSLT, and Power Query to Improve Efficiency and Timeliness

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Disclosures

- No financial interests
- Not an expert
- Not better

What's the problem?

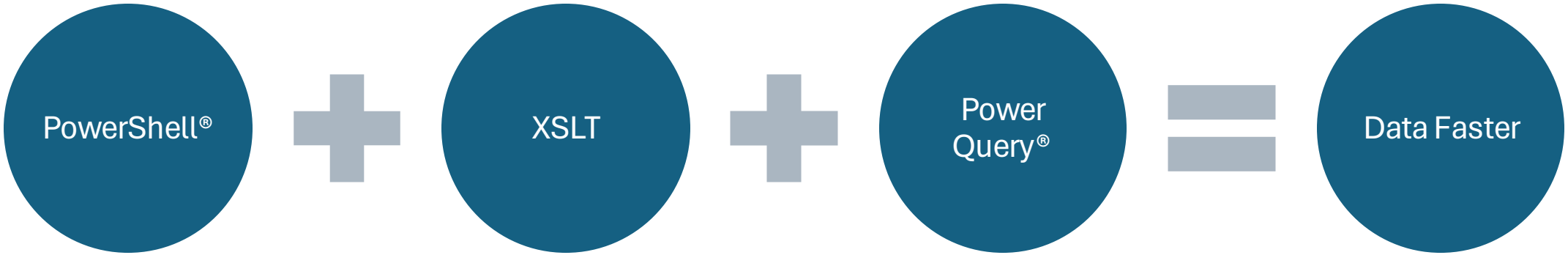
Needs:

- Testing
- Data validation/ Quality assurance
- Efficiency

Challenges:

- Unable to use R scripts
- Slow
- Small team

Solution



* XSLT= Extensible Stylesheet Language Transformations

How did we do it?

Three methods used:

A. Pull variables from eCR to CSV

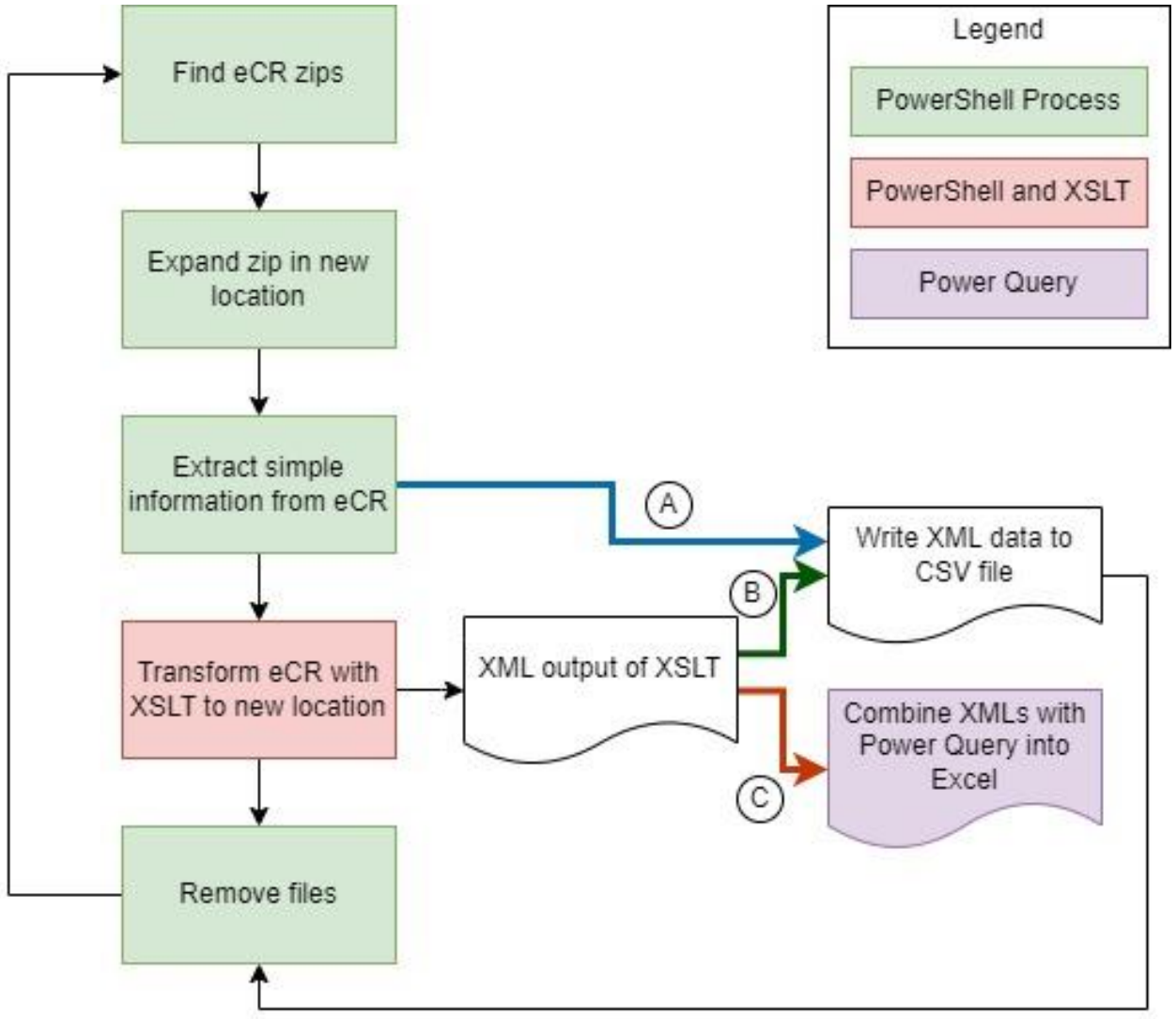
   Good for simple, non-repeating elements

B. Transform eCR and Write to CSV

   Good for elements that have the potential to repeat and can be made very specific.

C. Transform eCR and use Power Query® to combine output XMLs

   Good for **displaying** repeating elements (meds, problems, etc.). Can be very specific if needed.



Data Validation and QA

- It worked!
- Able to test rules not in DQ Schematron
- Compare elements across different senders
- Sandbox for testing Xpaths

HCO	Count of eCRs	Number of Planned Observations	Number of Planned Procedures	Planned Observation per eCR	Planned Procedure per eCR
HCO-A	2,497	23,942	137	9.59	0.05
HCO- B	10,276	0	51,319	0.00	4.99
HCO-C	104	0	863	0.00	8.30
HCO-D	858	4,010	1,864	4.67	2.17
HCO-E	207	0	0	0.00	0.00
Grand Total	13,942	27,952	54,183	2.00	3.89

eCRs received from 01Jan24-01Mar24

Efficiency

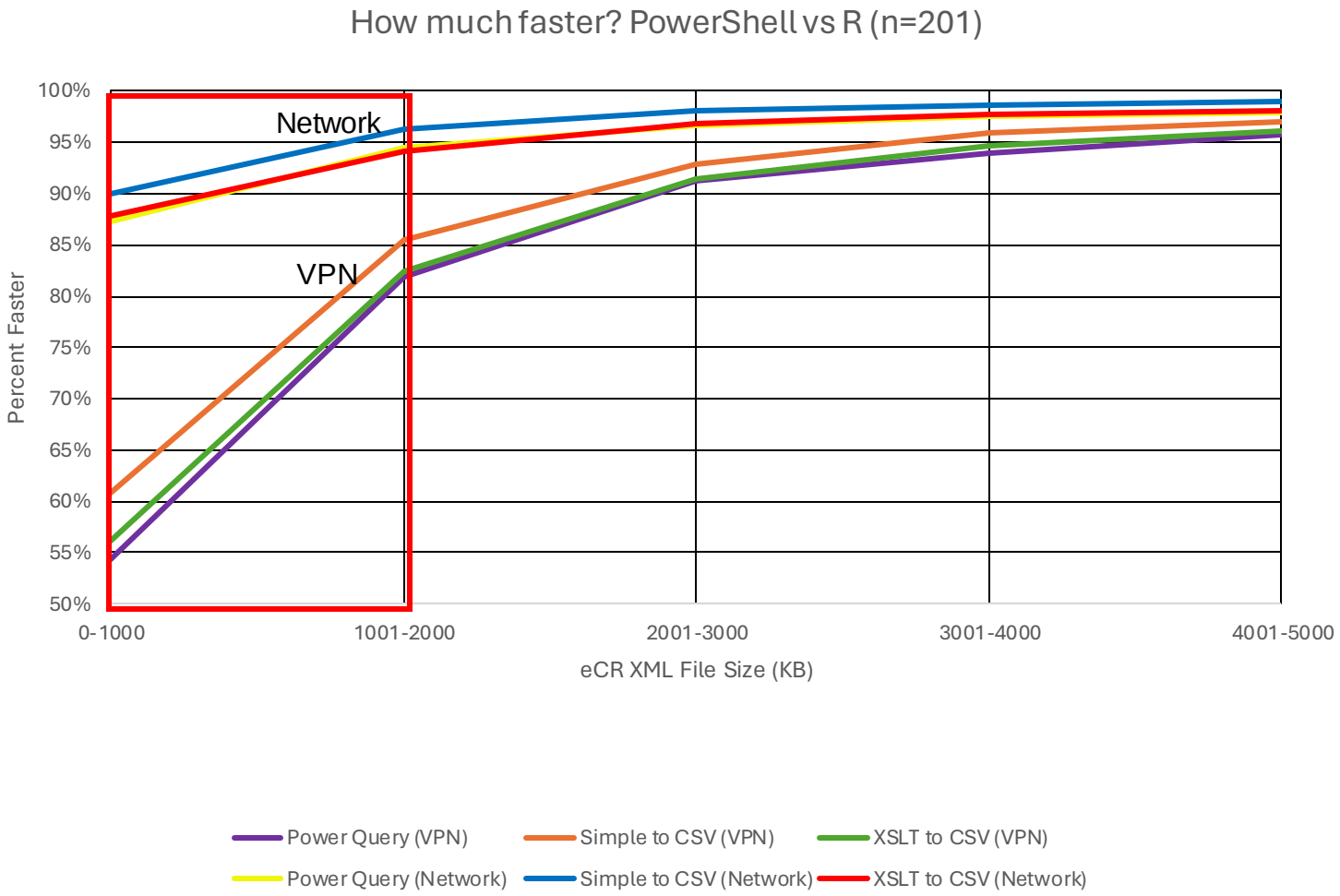
PowerShell® compared to R (parsing the same elements into a CSV file)

- >16X faster on the state network
- >3X faster over VPN

Real Life Example:

In a 15-minute period

- PowerShell® parsed 2,700-15,000 eCRs
- R parsed 900 eCRs



>90% of eCRs in a 3-month period

More than just a parser

- Search for and copy specific files to a new location
- Transform eCRs into extracted HTMLs for staff
- Search for specific condition codes in RR
- Compare SNOMED codes in eCRs to surveillance system mappings
- Make your script talk

```
Add-Type -AssemblyName System.Speech
$synth = New-Object -TypeName System.Speech.Synthesis.SpeechSynthesizer
$synth.SelectVoice("Microsoft David Desktop")
$synth.Speak("Your script is done, and I am a sentient machine. Bow down to the computer overlords.")
```

Conclusion

- [x] Alternative to R scripts
- [x] Validation/ QA/ Testing
- [x] Efficient and Fast
- [ ] The Best Option

Thank You

- Lynn Sosa, MD
- Nancy Barrett, MPH, MS
- Sue Speers, MPH
- Informatics Team

Contact

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Resources

https://github.com/mikeeschneider/CSTE2024