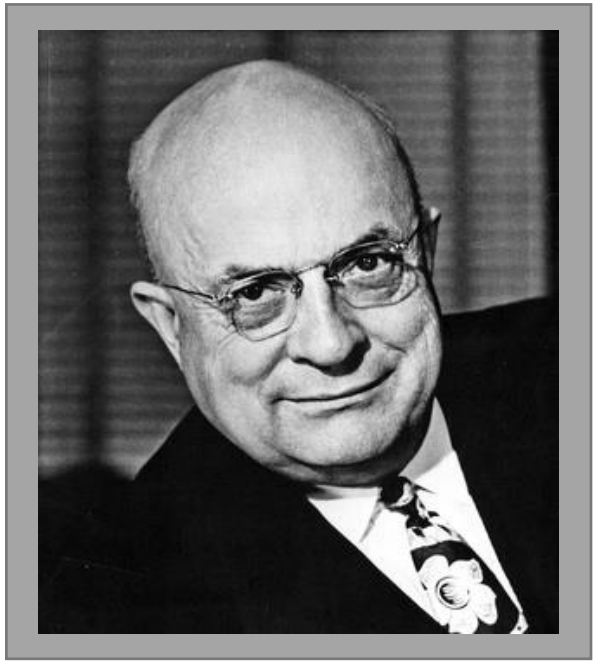
Rapid Converter Framework

An approach to ultra-fast converter development

Paul-James Jones, Justin Van Duine & Bo Du

Fall, 2020



Our Inspiration: Henry J. Kaiser

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- In order to move beyond the hobbyists' workshop model we need to be inspired by Kaiser's example.

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- It is based on Kaiser’s core principles:
  - Ruthless Simplification
  - Ruthless Standardization
  - Ruthless Separation (into tiny, elemental steps)

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- What you will see here is not necessarily the final form of the Rapid Converter Framework that we might implement, but it is intended to show what's possible and where we're going...


Lets Start

In the beginning…

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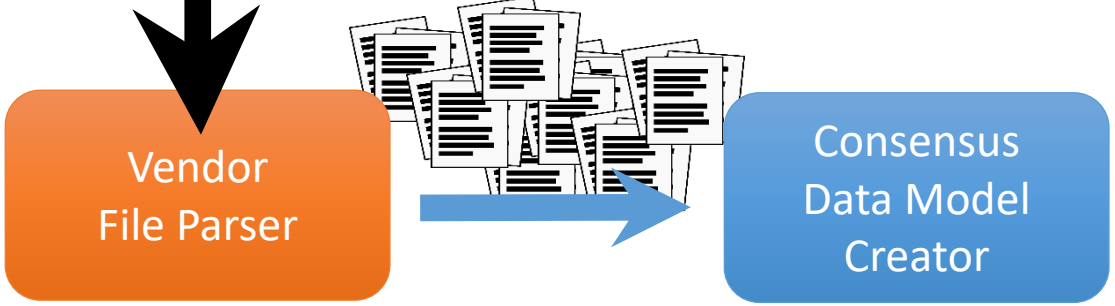
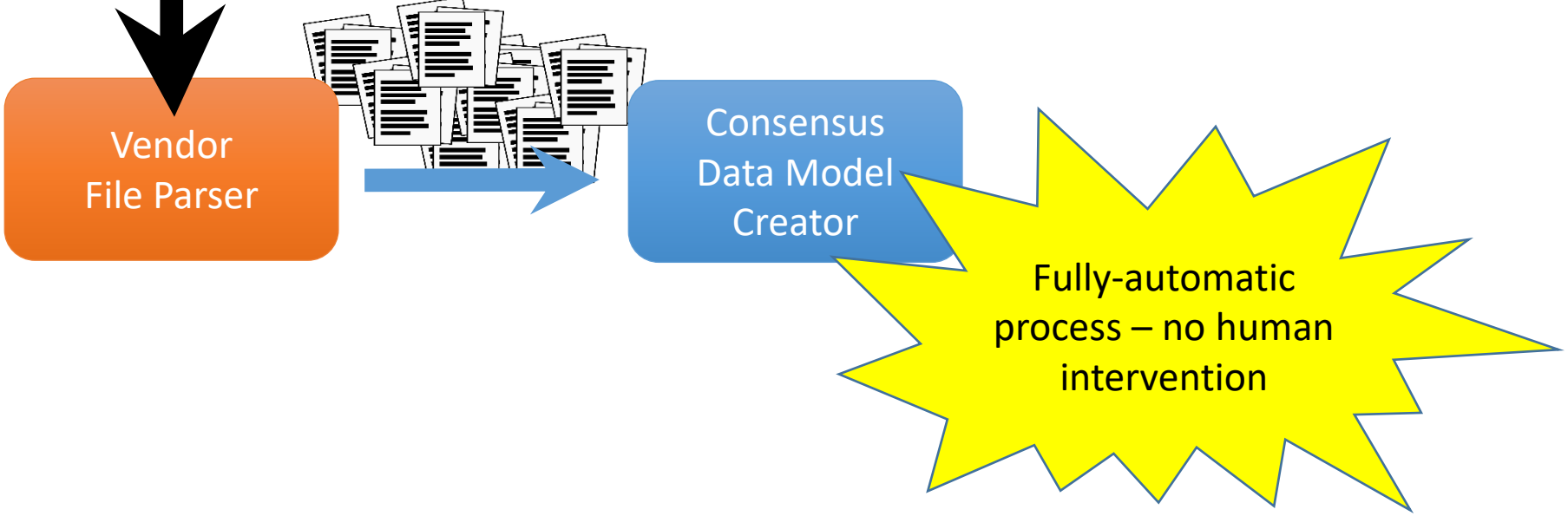
If you can’t read the vendor file, there is no realistic chance to ever build a converter

In the beginning…



As soon as you can read the vendor file, we can “feed” the the Data Model Creator to automatically build (*i.e.* write code for) a minimalistic, first-version “Consensus Data Model” for us.



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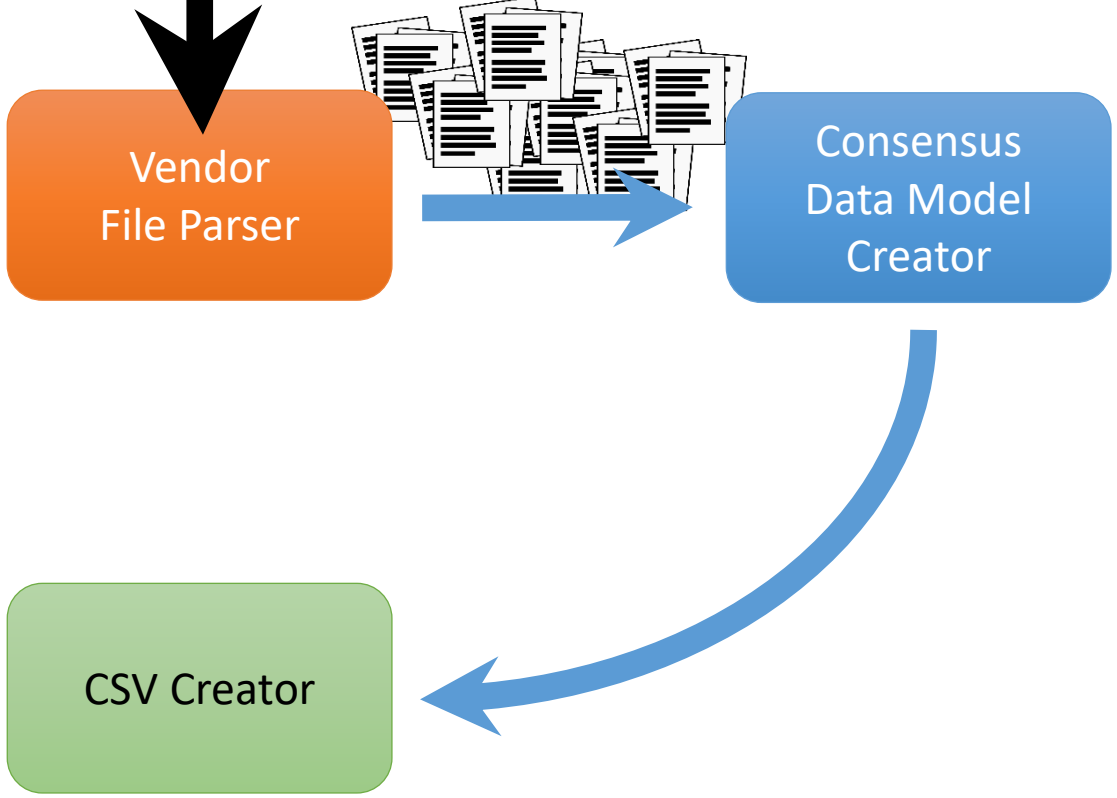
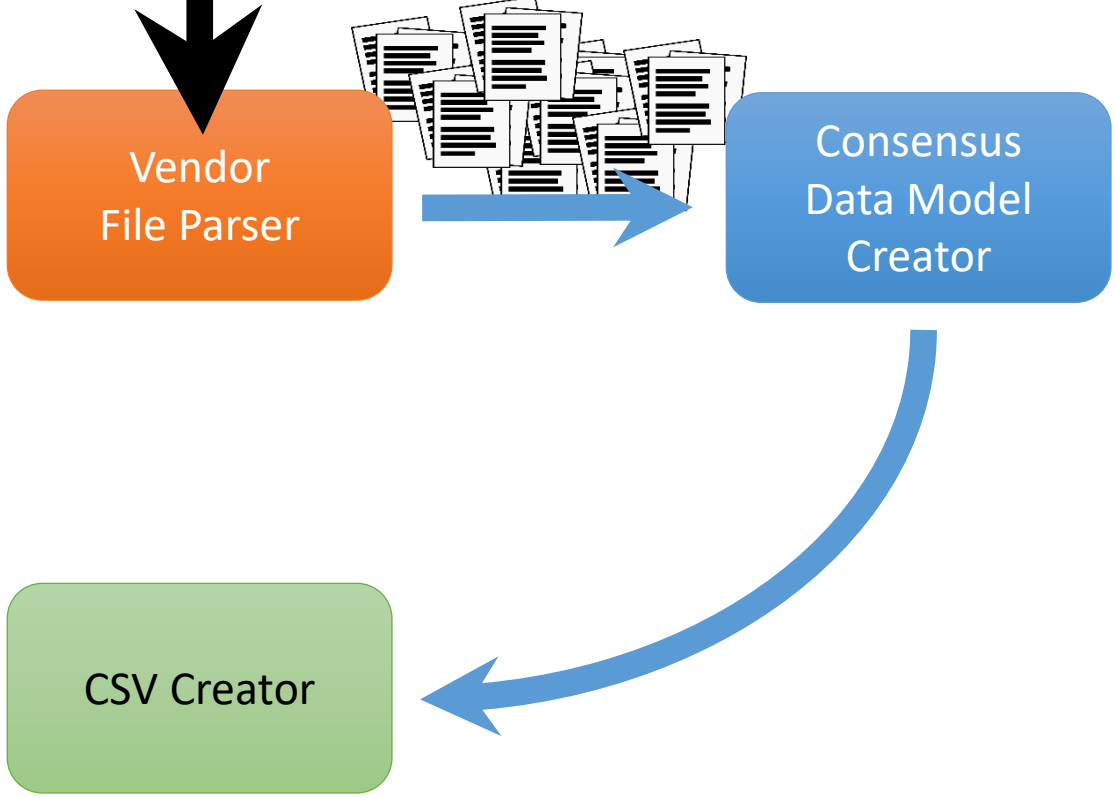
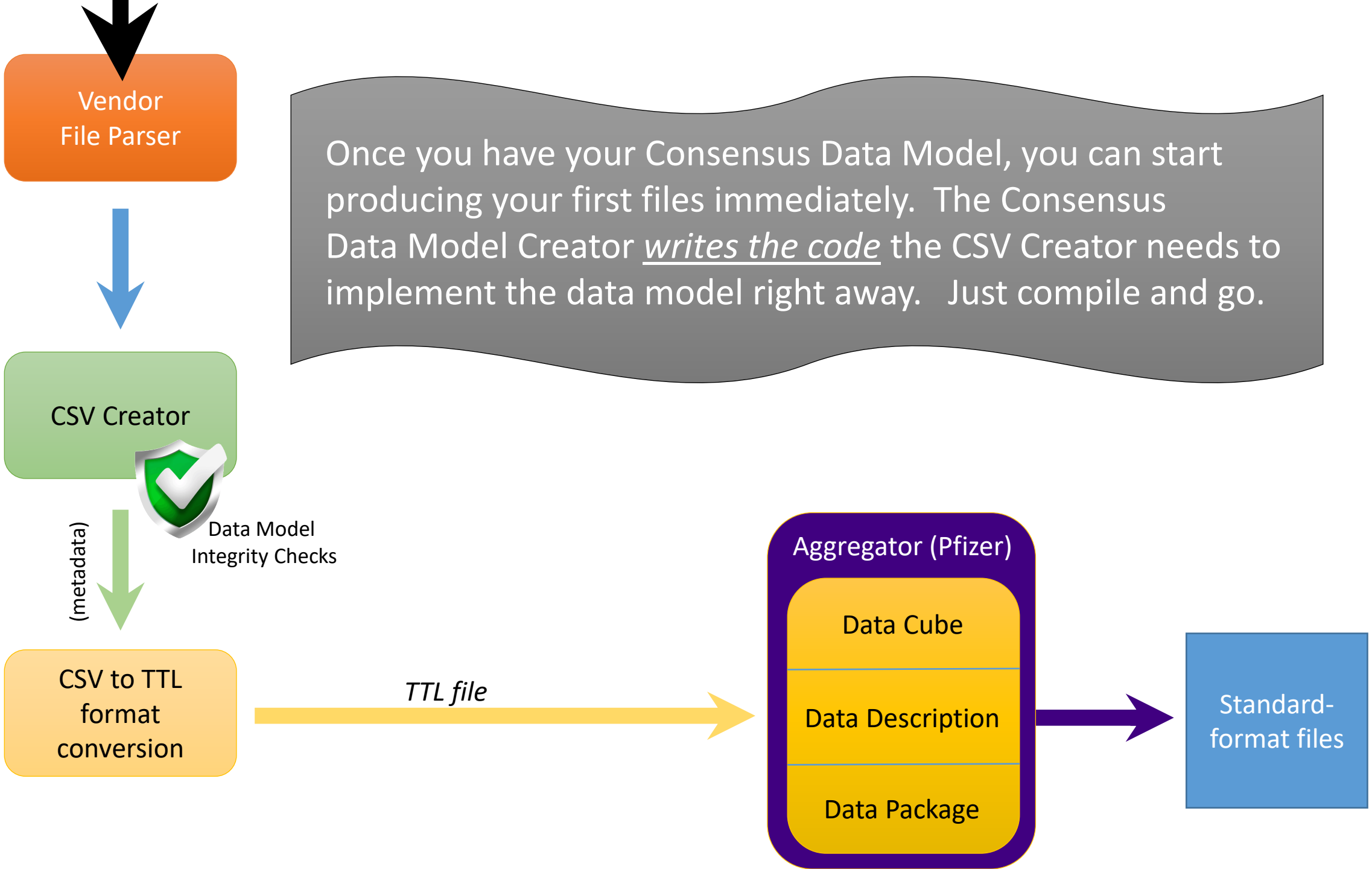


We have decided to standardize on CSV as a “messaging” format between the components of the Rapid Converter Framework.
This is not necessarily a final design decision: JSON also possible...



One side benefit to this particular step is that you get to stress-test your File Parser against the diversity of vendor file format variations that you might reasonably expect to encounter in the wild.


Vendor
File Parser
Once you have your Consensus Data Model, you can start producing your first files immediately. The Consensus Data Model Creator *writes the code* the CSV Creator needs to implement the data model right away. Just compile and go.
CSV Creator
Data Model
Integrity Checks
(metadata)
CSV to TTL
format
conversion
TTL file
Aggregator (Pfizer)
Data Cube
Data Description
Data Package
Standard-
format files

The process

- Of course, the “Consensus Data Model” is the bare minimum we need to create standard-format files. But using the “Consensus Data Model” approach allows us to decouple the much slower “Final Data Model” development from converter creation.

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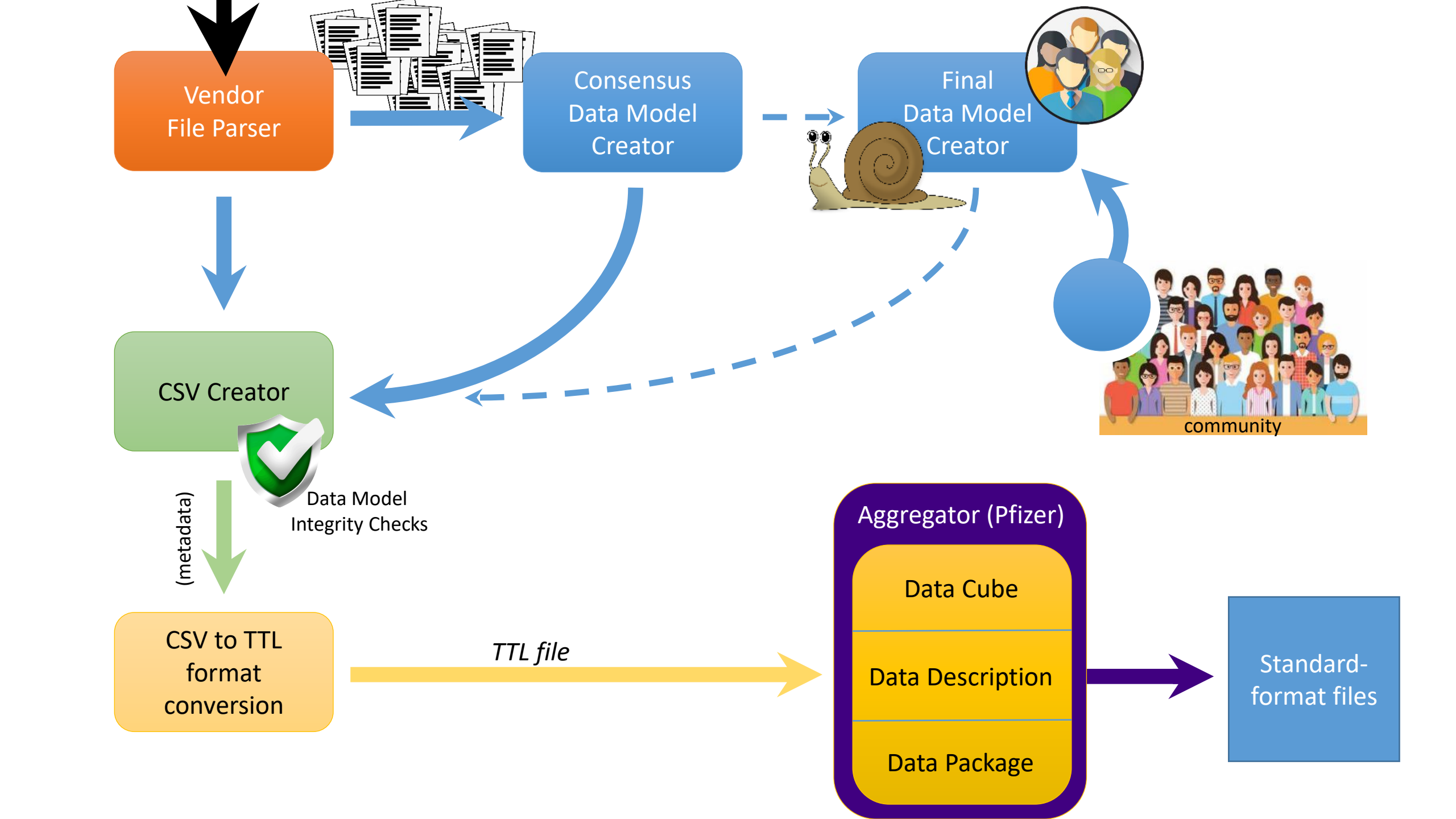
- This allows our Companies to get much-needed near-term ROI by getting *real data* into standard-format files quickly so our scientists can poke it, prod it, and get used working with to it.


Vendor
File Parser
Consensus
Data Model
Creator
Final
Data Model
Creator
CSV Creator
Data Model
Integrity Checks
(metadata)
community
CSV to TTL
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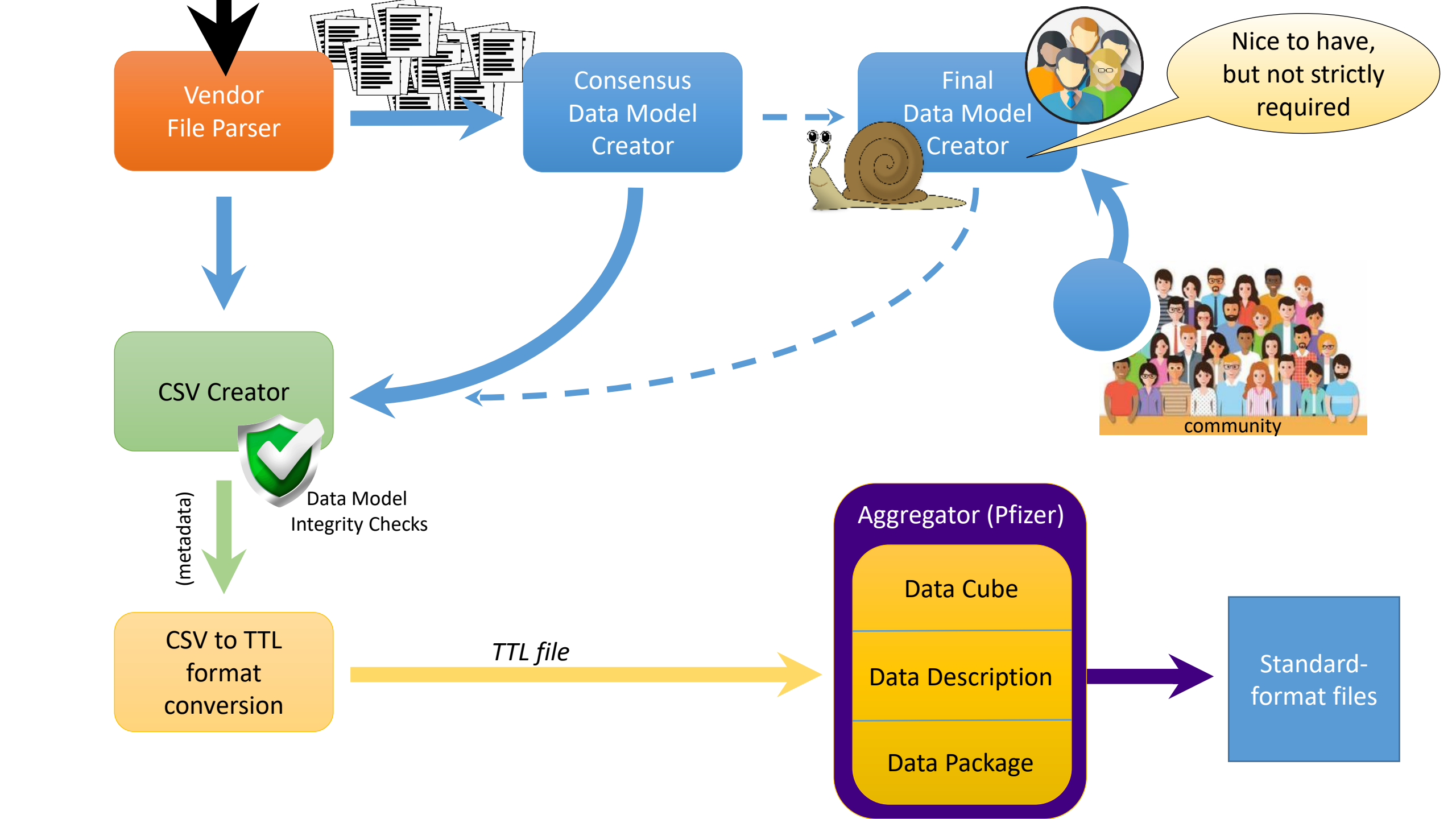
Vendor
File Parser
Consensus
Data Model
Creator
Final
Data Model
Creator
Nice to have,
but not strictly
required
CSV Creator
community
Data Model
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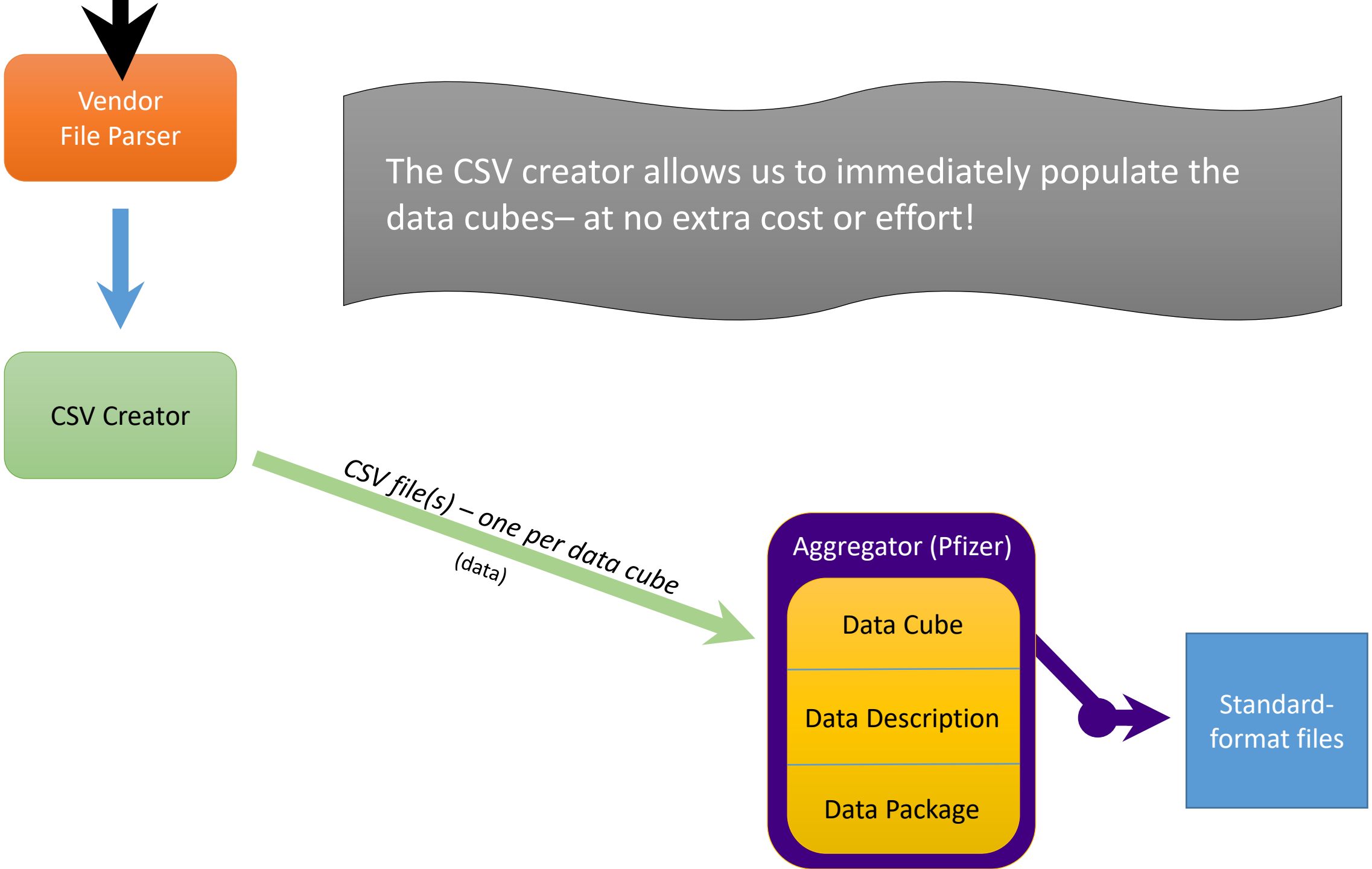
Vendor
File Parser
The CSV creator allows us to immediately populate the data cubes– at no extra cost or effort!
CSV Creator
CSV file(s) – one per data cube
(data)
Aggregator (Pfizer)
Data Cube
Data Description
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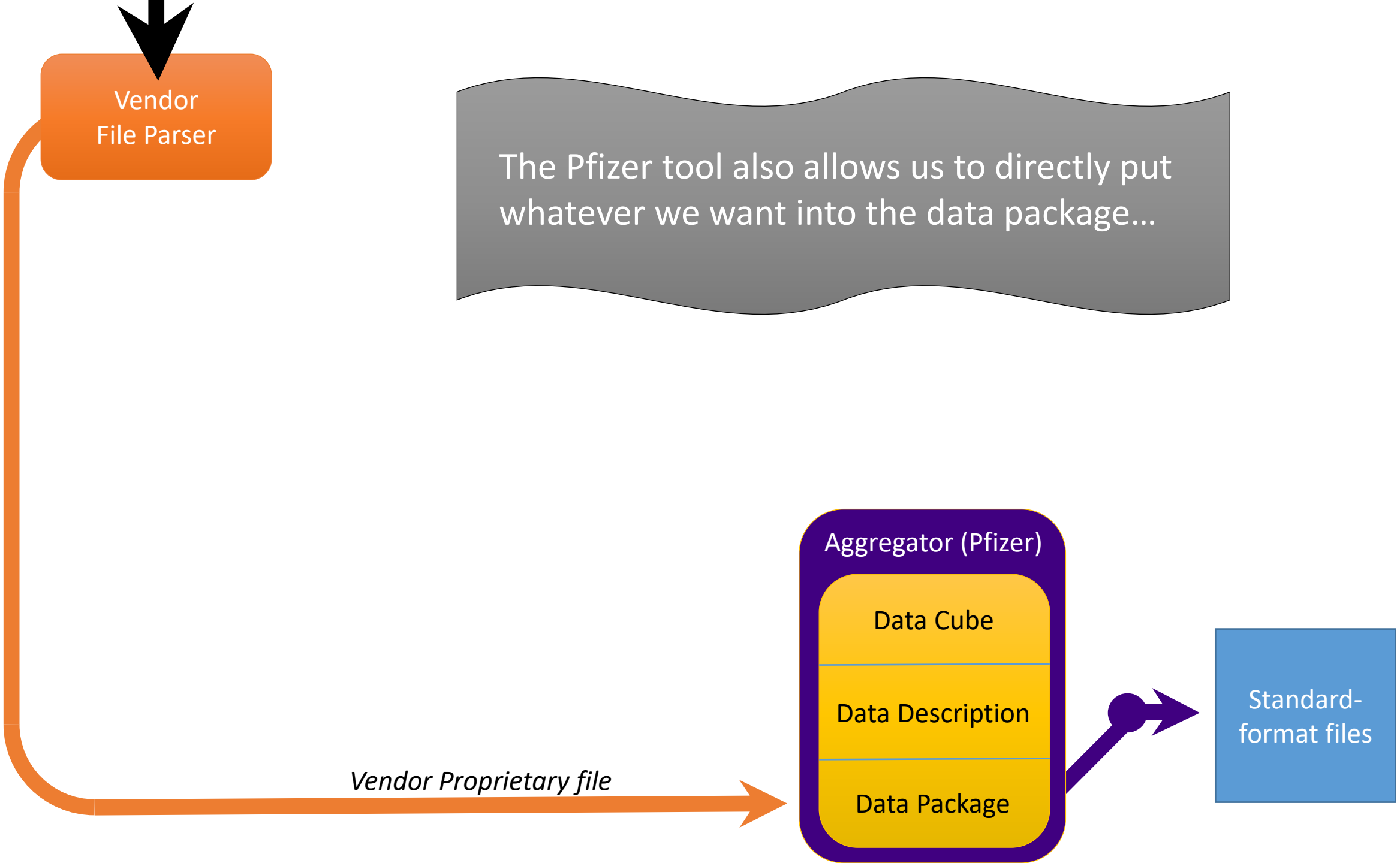
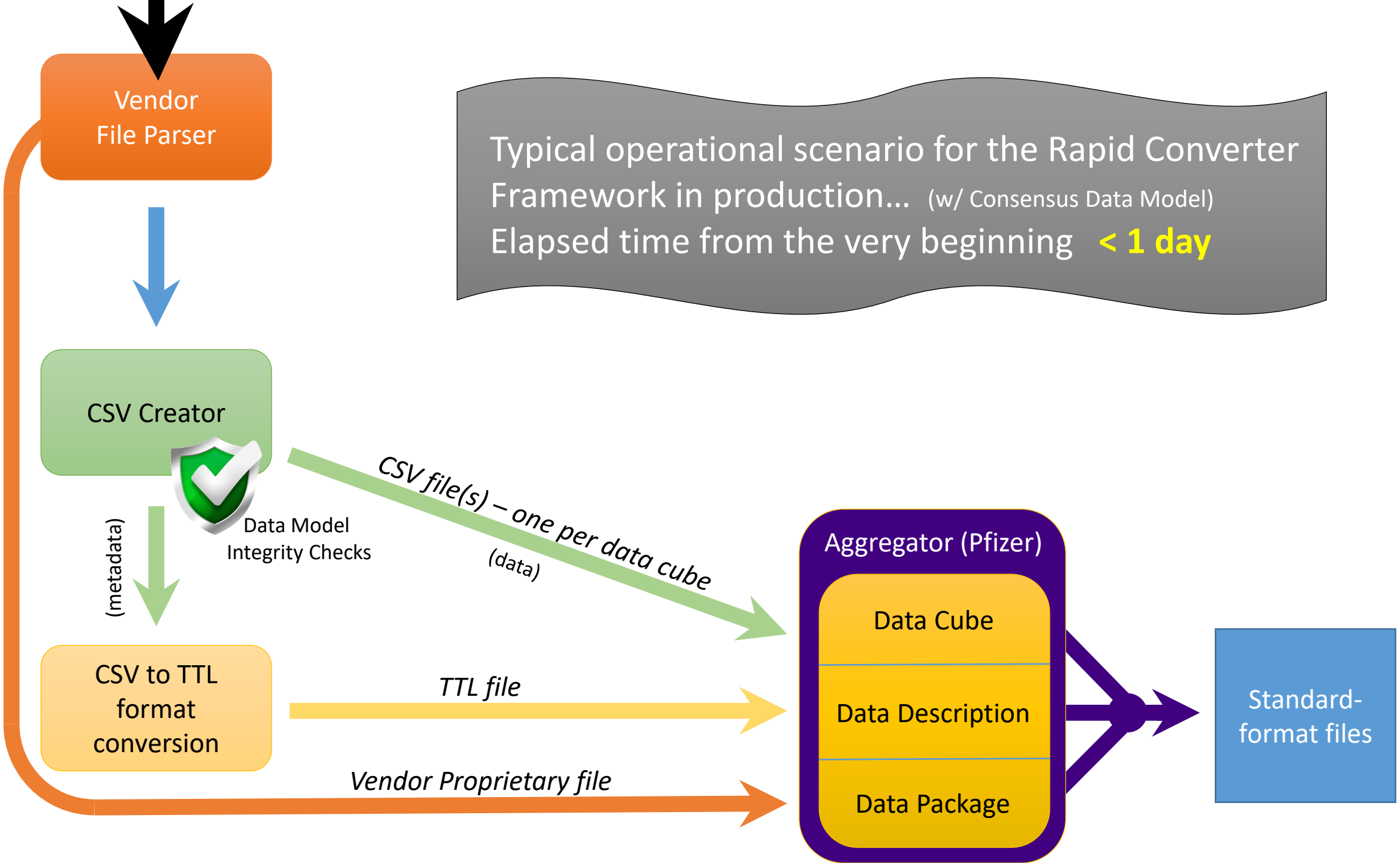
Standard-format files


Vendor
File Parser
The Pfizer tool also allows us to directly put whatever we want into the data package…
Aggregator (Pfizer)
Data Cube
Data Description
Data Package
Vendor Proprietary file
Standard-format files


Vendor
File Parser
Typical operational scenario for the Rapid Converter Framework in production... (w/ Consensus Data Model)
Elapsed time from the very beginning < 1 day
CSV Creator
Data Model
Integrity Checks
(metadata)
CSV file(s) – one per data cube
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(for example: peaks in Data Description *vs.* peaks in Data Cubes…)

or

(for example: metadata as JSON *vs.* TTL in the Data Package…)

Example: Incorporating manually-produced leaf-node, full-graph or hybrid data models

Vendor File Parser

CSV Creator

TTL file

(metadata)

CSV file(s) – one per data cube

(data)

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Data Cube

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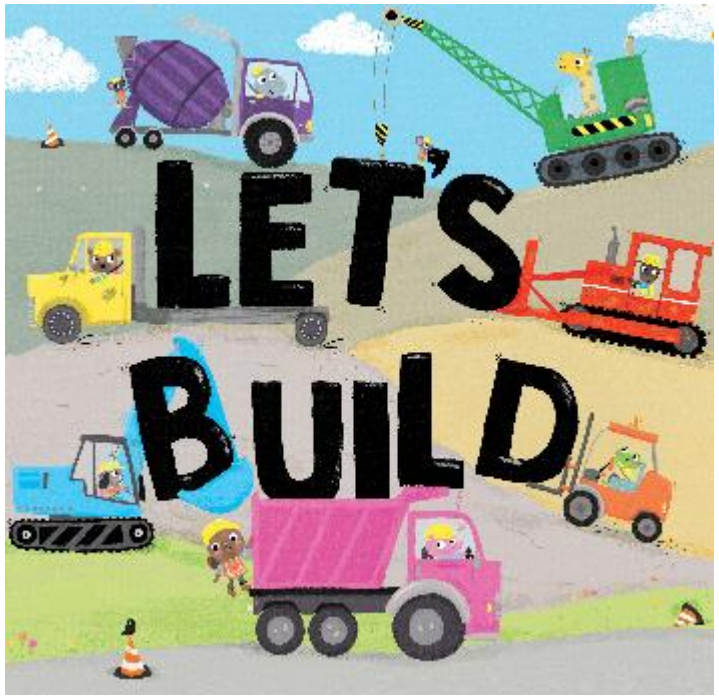

converters

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- Once the file parser is in hand, the turnaround to being able to produce the first complete (DD + DC + DP) files for a new type of vendor file *is typically on the order of a day or two*.
- We employ extensive instance data checking at several places in the process in order to minimize the amount of post-hoc validation required.

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- The thought is to ultimately redeploy this network as a collection of pluggable REST microservices to support massive, rapid converter development & deployment across the enterprise.

“Start swinging!”