

GEFEG - at home in Berlin



Smart API Generation

The use of Reference Data Models as UN/CEFACT and WCO for harmonized and interoperable Application Programming Interfaces (API)

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Examples of customs related API's

Public authorities solutions

U.S. Single Window

New Zealand Trade Single Window

U.K. HMRC Developer Hub

Window U.S. single

Window Trade single Zealand

Hub Developer U.K. HMRC

Private companies solutions

Shipmondo

Tradelens

UBSend

...

Shipmondo

Tradelens

UBSend

...

Agenda

- About GEFEG
- A brief look into Web API's
- Problems with current API solutions
- Conclusion
- Next steps

Getting higher Data Quality

with eBusiness Interface Management, Standards and Validation

Providing smart and innovative solutions for eCommunity meta data management

meta data management solutions for eCommunity providing smart and innovative

Actively involved in national and international eBusiness & eGovernment standardisation

eGovernment standardisation international eBusiness & actively involved in national and

Support of eBusiness and Electronic Data Interchange

1990 - today - tomorrow



Customers

Automotive



AIAG, BMW, Brose, Continental, Ford, Goodyear, Hella, Leoni, MAN, Odette, Porsche, Scania, SKF, Volkswagen, VDA, Volvo, Wabco...

Finance & Insurance



Aareal, BITS (Norway), Deutsche Bank, Deutsche Bundesbank, Equens, EPC, KfW, NPSO, Open Banking, SCFS, SIX, STUZZA, SWIFT, T2S, UBS, Vocalink...

Electronics



AMP, Bosch, Electrolux, Fujitsu, Hitachi, Hewlett Packard, IBM, Infineon, MD Elektronik, Osram, Sharp, Siemens, Texas Instruments, Toshiba, Zollner...

Consumer Goods



Dänisches Bettenlager, Dr. Oetker, Harry-Brot, Henkel, Hilcona, Henkel, Hugo Boss, Karstadt-Sports, Lindt, Merck, Nestlé, Tesa, Storck, Stihl...

Retail / Wholesale



GS1 (CH, DE, FR, NL, ES...), COOP, Kaufland, Media Markt, Migros, Otto, REWE, TractorSupply...

Logistics & Transport



Dachser, Dakosy, Deutsche Post, DHL, Emons, FIATA, HAVI, IATA, Kühne + Nagel, Norgren, Planzer, Rhenus, SBB Cargo, Schenker, TNT...

Information Technology



AEB, Axway, Blujay, CAS, Deutsche Post, IBM, Filiadata, Freudenberg IT, Intrasoft, SAP, Mercoline, REHAU, Rhetarus, Seeburger, T-Systems...

Public Sector



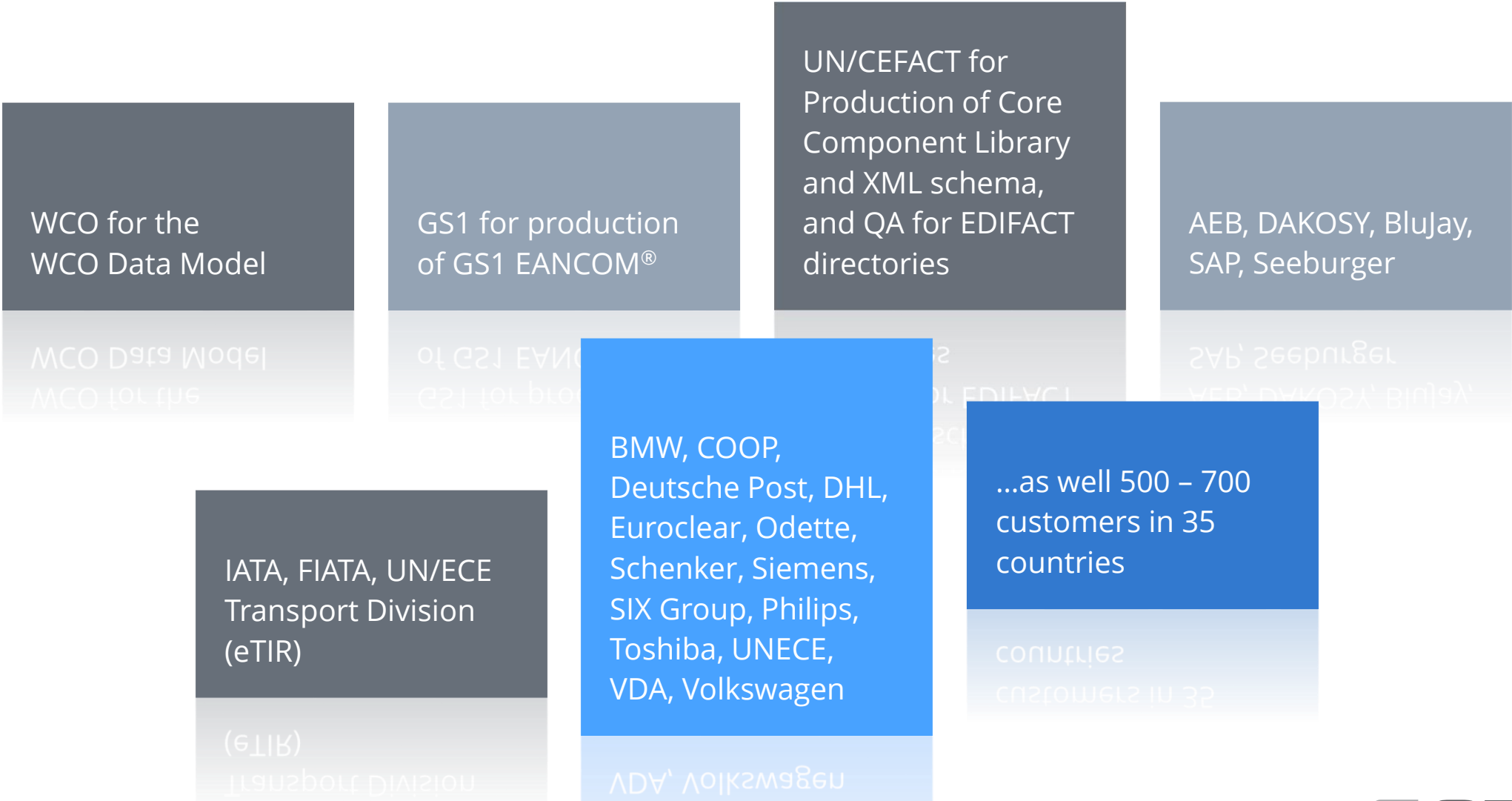
Customs (DE, CA, NL, NZ, ...), BMI, DCMA (U.S.), ITZ Bund, Svenska Kommunförbundet, UN/CEFACT, **WCO**, X12, Zivit...

Other Industries



Alfa Laval, Bayer, Benteler, Boeing, EnBW, E.ON, John Deere, Georg Fischer, Lanxess, Norgren, Rehau, RWE, Siemens, Vattenfall, Velux, Würth...

GEFEG Software and Technologies in use by Major Players



API's in the web

A brief look into using APIs in the internet

Basic idea: Providing service building blocks

Examples

- Currency converter
- Payment service
- Identification services

⇒ A web shop can focus on its business

⇒ Identity management allows the establishment of trust for new business relationships

Explorer E-Scooter ESA 1919 mit Straßenzulassung

1 349,99 € 349,99 €

Ab einem Bestellwert von EUR 100,00 liefern wir innerhalb Deutschlands **versandkostenfrei**.

Wenn vorhanden, dann geben Sie hier einen Aktionscode ein:

Zwischensumme: 349,99 €
Versandkosten: 0,00 €
Gesamtsumme 349,99 €
(inkl. 55,88 € MwSt.)

einlösen

weiter shoppen

amazon pay >>
NUTZEN SIE IHR AMAZON KONTO
oder
Direkt zu PayPal

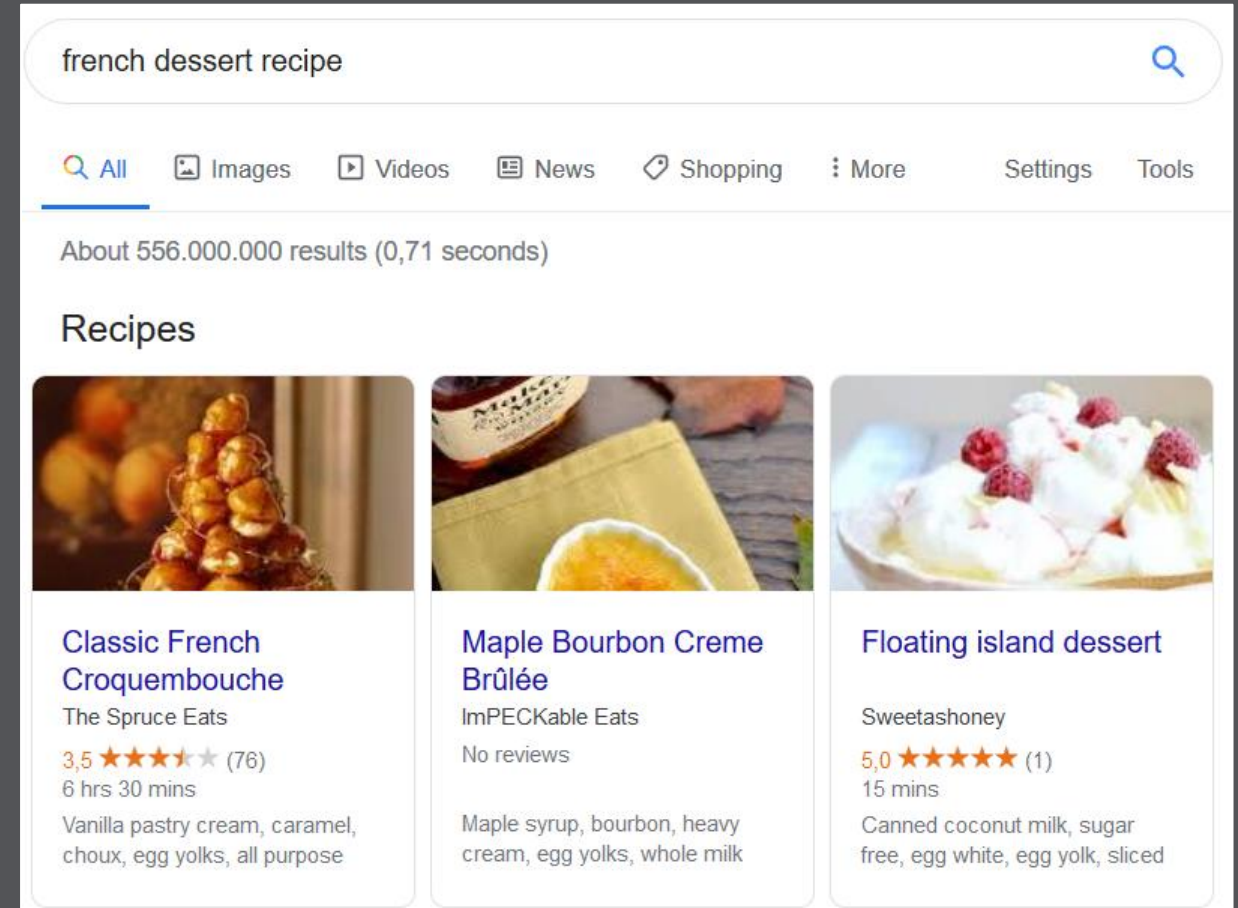
weiter shoppen

The semantic web: Harmonized definitions

Example: Search for a recipe

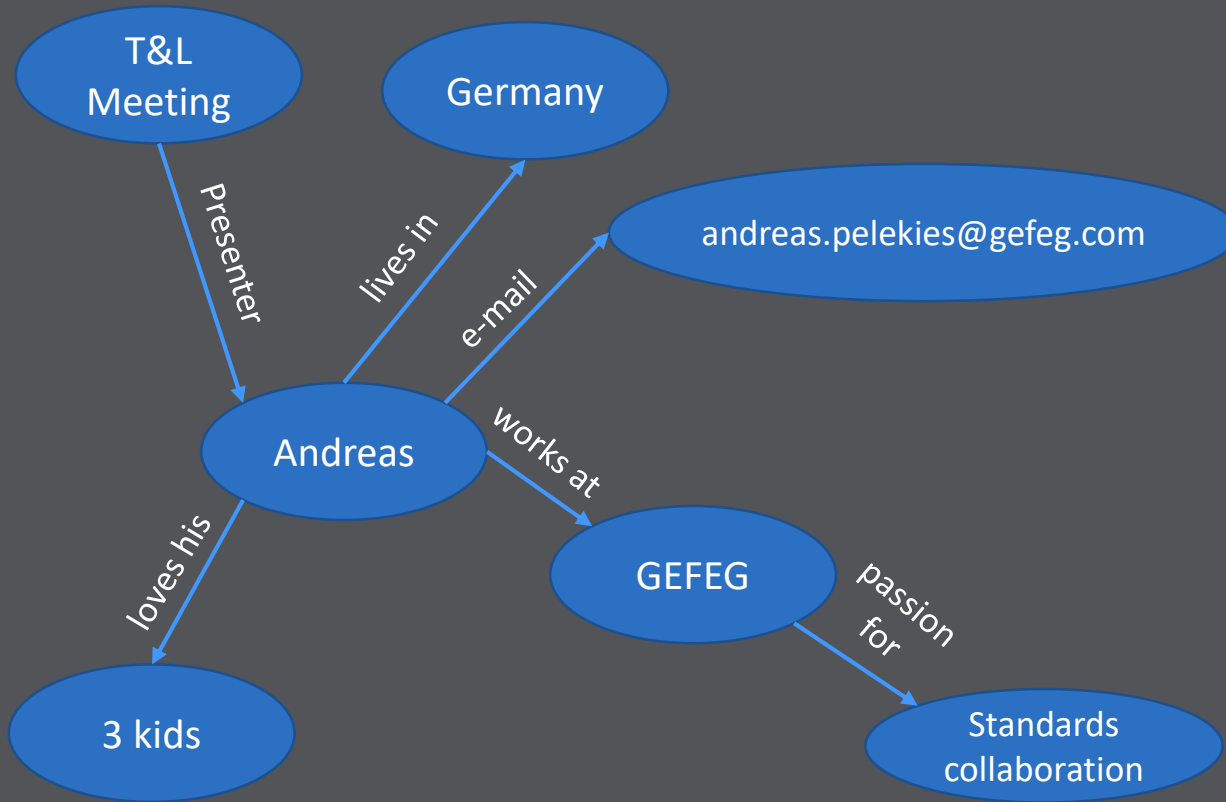
- The search engine does not process the information itself.
- The website with the recipe already delivers metadata information in a harmonized format
- This kind of structured information is published e.g. at schema.org in a computer readable format

⇒ Publication as a vocabulary



Semantics and links in a vocabulary

- Mostly published in JSON format



schema.org

Custom Search

Home Schemas Documentation

Person

Thing > Person

A person (alive, dead, undead, or fictional). [\[more...\]](#)

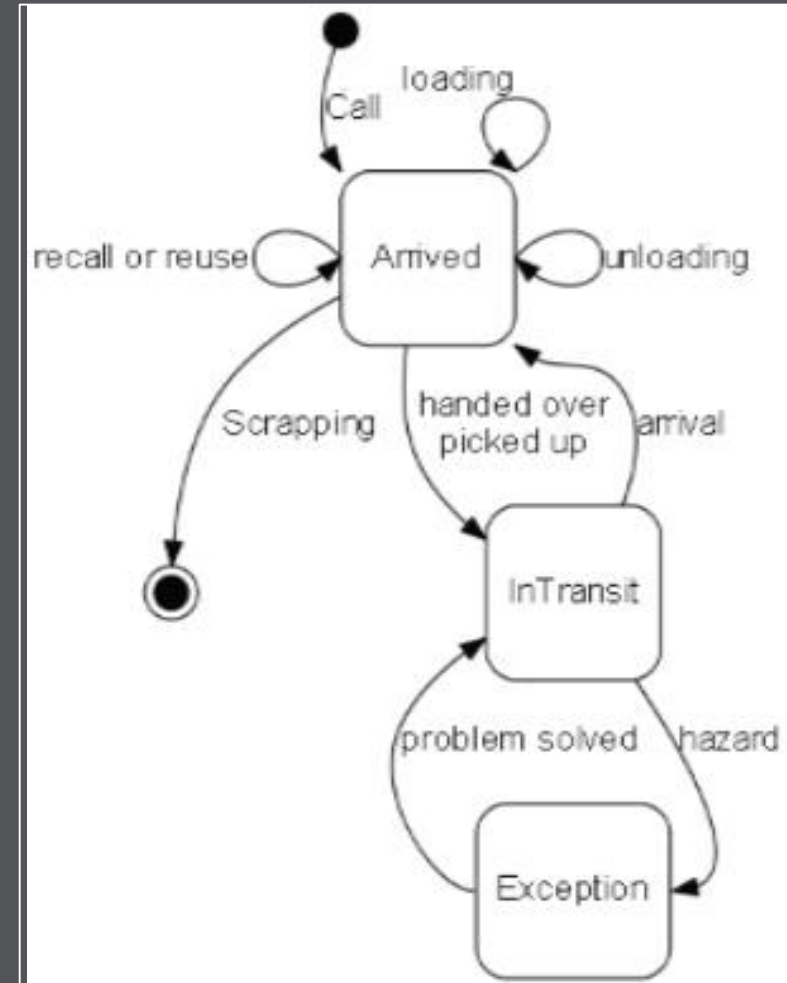
Property	Expected Type	Description
Properties from Person		
additionalName	Text	An additional name for a Person, can be used for a middle name.
address	PostalAddress or Text	Physical address of the item.
affiliation	Organization	An organization that this person is affiliated with. For example, a school/university, a club, or a team.
alumniOf	EducationalOrganization or Organization	An organization that the person is an alumni of. Inverse property: alumni .
award	Text	An award won by or for this item. Supersedes awards .
birthDate	Date	Date of birth.
birthPlace	Place	The place where the person was born.
brand	Brand or Organization	The brand(s) associated with a product or service, or the brand(s) maintained by an organization or business person.
brand	Organization or BusinessPerson	The brand(s) maintained by an organization or business person.
brand	Brand or Organization	The brand(s) associated with a product or service, or the brand(s) maintained by an organization or business person.
birthPlace	Place	The place where the person was born.
birthDate	Date	Date of birth.
award	Text	An award won by or for this item. Supersedes awards .

Adding life cycle definitions for a resource makes the difference

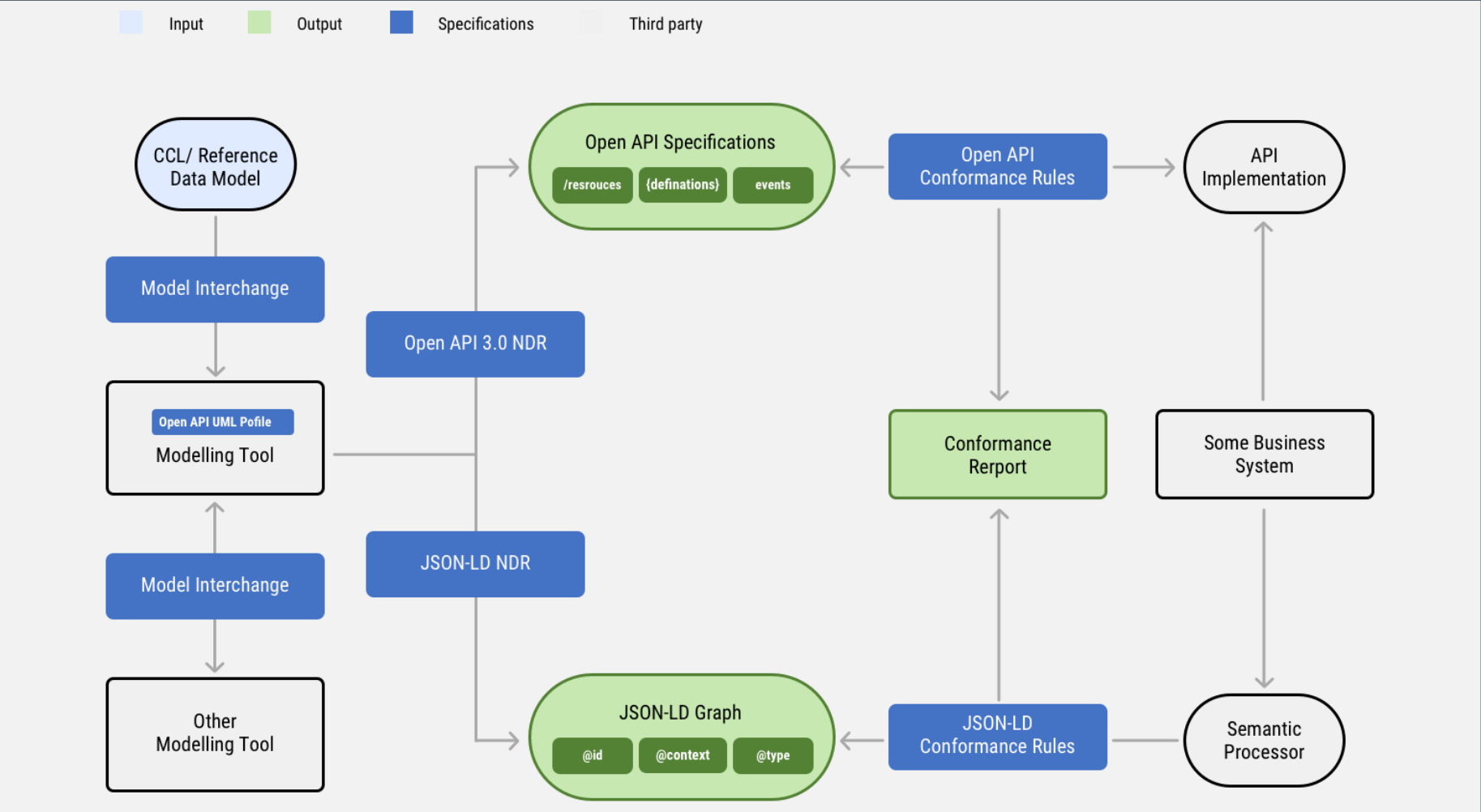
APIs allow a paradigm change:

- They can be used as an access point to existing message structures (document based view)
- They allow data handling in a resource based view. E.g.
 - Voyage / Itinaries
 - transportMovements
 - Carrier, Submitter, Exporter, ... (Parties)
- Defining states and events for resources enable flexible processes of API users and even exception based process management

Simplified container life cycle

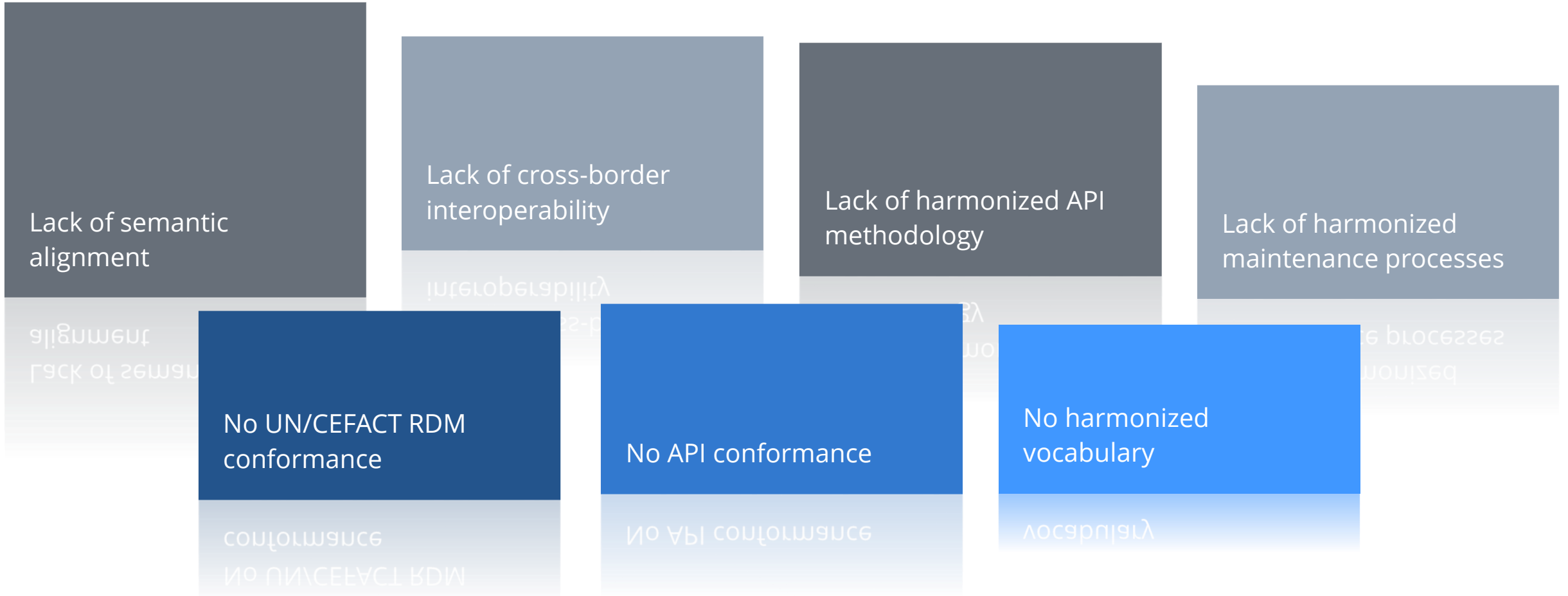


UN/CEFACT EDI3 development



Problems with current API solutions

These are the problems of existing API solutions



This leads to

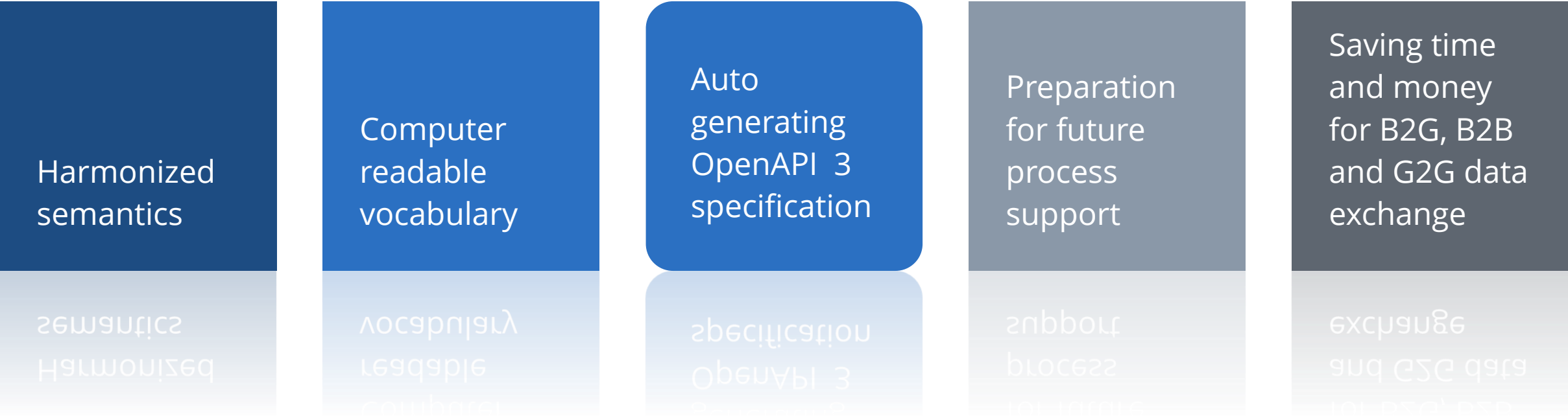
Increased
implementation
complexity

Higher
implementation
costs

Huge maintenance
costs

Conclusion

Using UN/CEFACT Reference Data Models for a harmonized and interoperable vocabulary and API methodology



GEFEG solutions

GEFEG.SmartAPI Portal

- Auto generation of OpenAPI 3 conformant API specification
- Easy import to other tools like Swagger

The screenshot displays the SmartAPI portal interface. At the top right, there is a "Log Off" button with a lightning bolt icon. The main header "SmartAPI" is in blue. Below it is a navigation bar with four items: "START", "STANDARDS", "DOWNLOADS", and "GEFEG.SMARTAPI CLIENT". A breadcrumb trail shows "Home > Standards". The main content area is titled "Standards" with a grid icon and a description: "Page which controls and displays all standards of the project." Below this is a control bar with a "+ New" button, a "Settings" dropdown, a "View: -Main-" dropdown, and a search input field. The main content is a table with columns: "Alias", "Json-LD", "Linked Json-LD", "OpenAPI", "State-Machine-Diagrams", and "Comment". The table has a "Specs" folder icon and several rows of data, including "Demo WCO" and "eCMR".

SmartAPI

Log Off

START STANDARDS DOWNLOADS GEFEG.SMARTAPI CLIENT

Home > Standards

Standards

Page which controls and displays all standards of the project.

+ New Settings View: -Main- Search...

Alias ↓ 1	Json-LD	Linked Json-LD	OpenAPI	State-Machine-Diagrams	Comment
Specs					
Demo WCO	json-ld.zip	linked-json-ld	demo wco.yaml	state-machine-diagrams	
eCMR	json-ld.zip	linked-json-ld	ecmr.yaml		
eCMB	json-ld.zip	linked-json-ld	ecmb.yaml		
Demo WCO	json-ld.zip	linked-json-ld	demo wco.yaml	state-machine-diagrams	

GEFEG

GEFEG.SmartAPI Portal

```
openapi: "3.0.2"
info:
  title: "eCMR Transport API Demo "
  description: This API is an demo for the transport section.
  termsOfService: https://unece.org
  contact:
  license:
  version: 1.0.0
servers:
paths:
  /dangerousgoods/{plateNumber}:
    get:
      tags:
        - eCMR
      description: Returns DangerousGoodsDetails by PlateNumber
      operationId: getDangerousGoodsByPlateNumber
      parameters:
        - name: plateNumber
          in: path
          description: The Registration/Plate Number of the transport means.
          required: true
          schema:
      responses:
  /ecmr/{ID}:
  /eta/{destination}/{plateNumber}:
components:
  schemas:
    eCMR:
      type: object
      properties:
        ExchangedDocumentContext:
        ExchangedDocument:
        SpecifiedSupplyChainConsignment:
          required:
            - SpecifiedSupplyChainConsignment
```

- Auto generation of yaml files

- Standardized developer documentation

eCMR Transport API Demo (1.0.0)

Download OpenAPI specification: [Download](#)
URL: <https://unece.org> | License: UN/CEFACT IPR Policy | Terms of Service

This API is an demo for the transport section.

eCMR

getDangerousGoodsByPlateNumber

Returns DangerousGoodsDetails by PlateNumber

PATH PARAMETERS

plateNumber	string
required	The Registration/Plate Number of the transport means.

Responses

- > 200 successful operation
- 404 not found

GET /dangerousgoods/{plateNumber}

Response samples

200

Content type: application/json

```
{
  "UNDGIdentificationCode": { ... },
  "RegulationCode": { ... },
  "TechnicalName": { ... },
  "UpperPartOrangeHazardPlacardID": { ... },
  "LowerPartOrangeHazardPlacardID": { ... },
  "PackagingDangerLevelCode": { ... },
  "ProperShippingName": { ... },
  "TransportExpertTradeContact": [ ... ],
  "EmergencyTradeContact": [ ... ],
  "FlashpointTemperatureMeasurement": [ ... ]
}
```



Next steps

Join our Smart API initiative: Support, test and help us and yourself!

- Participate in testing and improving Smart API generation from customised UN/CEFACT Reference Data Models
- Save time and money by achieving interoperability and lowering costs



Passion for Standards



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