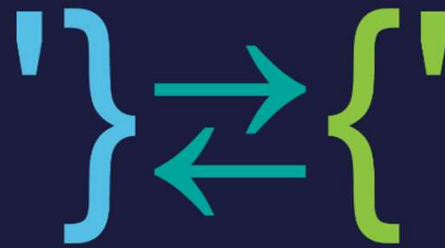




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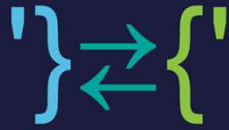
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API Chaos in the Travel Industry

The problem is wider than a spec



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Scope of the problem

- Typical trip booked with travel suppliers direct or thru channels:
 - Ground transportation to and from airport
 - Round trip air
 - Rental car at destination
 - Hotel
 - Restaurants
 - Activities such as golf, shows, convention,,,,
- With just 3 options for each category that's ~ 200 potentially bespoke APIs to work with
 - 18 offers with 153 potential relationships to sort out and keep in sync for a trip
 - IT costs ranging from \$100,000s to over \$1M
- Scaling up to 1000s of travel product and service providers, 10s of thousands of APIs is cost prohibitive



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Selling at the Trip level

- ~5.3 million hotel rooms across 169 hotel chains in the US
 - Most independently own as a franchise (often local PMS)
 - 4,600 boutique hotels (< 100 rooms)
- 1,126 commercial airlines worldwide
- Long distance travel by rail and bus far exceeds air outside the US
- 12,489 Tour Operators businesses in the US as of 2022
 - Many still lacking workable/affordable API access paths
- In addition, cruise, restaurants, golf courses, amusement parks, ground transportation (including ride share) ,,,,

10s of thousands of bespoke APIs



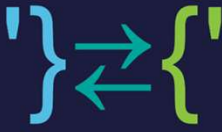
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API chaos contributors

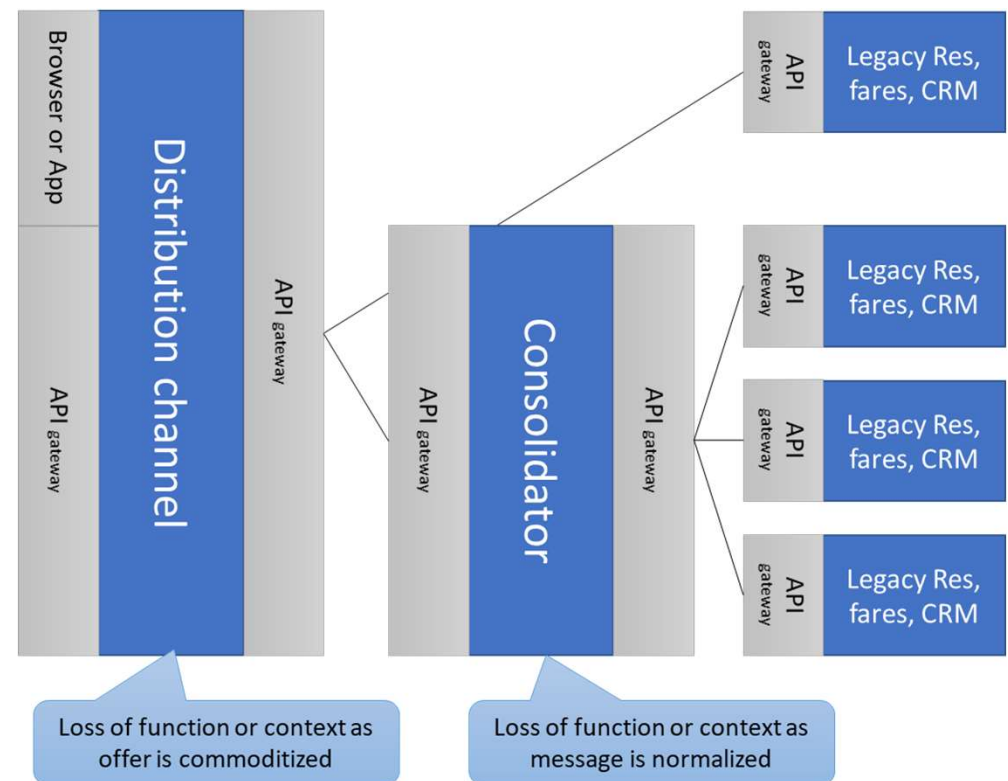
- What is not the problem:
 - The chaos is not caused by product descriptions, prices or rules
 - Good engineering handles variations in products or services, no need to commoditize products
- What is the problem:
 - Conflicting data definitions (reuse of the same term)
 - Conflicting data relationships (schema model)
 - Unknown or inaccessible rules (not just fare/price rules)
 - Unknown SLAs (operational expectations including downtimes)
 - In travel, conflicting use of caches which create booking errors
 - Conflicting or unknown API workflows including sequence rules
 - Conflicting or unknown error codes and paths
 - Conflicting or undocumented API behaviors (callbacks, path statements, variables ex: \$ref)
- Summary; differences in API documentation, behavior, data structures and more with no commercial value, just adds cost to interoperate

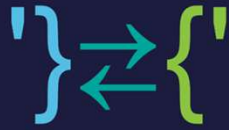


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Current Travel Retail

- Multiple layers of message “normalization”
- Travel products or services may traverse 5 or more bespoke API layers
- Each transition loses context of message (intent) and in many cases function is reduced to the lowest common denominator
- Time to market is slow and costs are high due to the complexity of fragile relationships
- Many in process of moving from XML to JSON





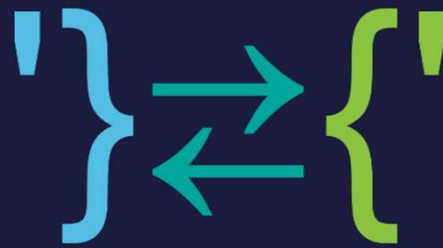
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Business Impact

- In the US, current mainline travel channels only transact \$120B out of the \$1.1T travel market
- Typical onboarding of a new travel supplier to a distribution channel takes 6 months to a year and >\$1M investment
 - Shuts out smaller players as potential booking fees don't cover the cost to connect
- Experience led travel retail not done at scale due to costs
 - AI/ML along with cloud technology capable of automating the most complex of personalized trips, the issue is the availability and quality of data due to API barriers



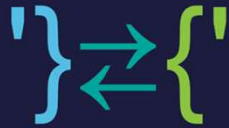
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As a community, expand our scope beyond specifications

We can fight API chaos



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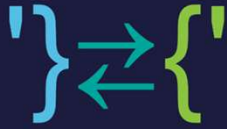
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Consider the business need

- **Sustainability (hence cost) of APIs impacted by:**
 - Fragility, often due to complexity at the schema level (variables, multi-path,,)
 - Error prone manual coding of schema
 - Sensitivity to technology changes
 - Reuse hard to achieve, resulting in many bespoke copies of the same basic function
- **API behaviors**
 - Inconsistency of data, SLAs
 - Indeterminable workflows, especially error paths
 - Callbacks



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The need is beyond the spec

- Widen community focus to what will foster consistency in API development, deployment, operation, and maintenance
 - Not a focus on ridged standards, rather how to make critical areas discoverable via automation
 - Best practices presented thru reference implementations leveraging industry sector trade associations and standards bodies
- Outside of API specs, how to address what is in the message and how it acts, not just the format of the message



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Approaches to consider

- Increase productivity via tooling
 - More sophisticated lint like tools to rate sustainability of an API
 - Automation of SLA compliance tests
- Left shift development, example using model driven development where tooling may be used to generate schema
 - Schema compliers which can create all artifacts from business object definitions

Example: <https://opentravel.org/download-otm-tool/>



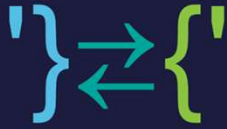
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Travel Specifically

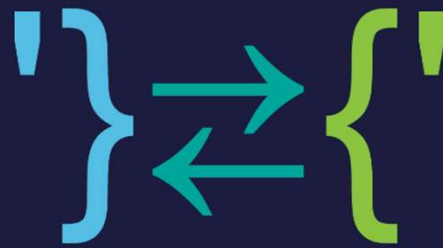
- Accelerate not just the move to the cloud but the move away from centralized, stateful, reservation solutions
 - Major parts of the bespoke nature of travel APIs is due to the quirks of the legacy backends, good architecture can address some, but not all issues
 - True REST architecture is the most obvious means to lower costs, meet the scale needed, and meet privacy demands such as GDPR
- Hundreds of millions of dollars of unmanaged travel is up for grabs if some of the suggestions made here are followed
 - Point is investment should not be a barrier



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Barriers to change

- **Business models dependent on API chaos**
 - In travel, gateways, consolidators, distribution companies charge per message or booking on the basic value proposition to hide the complexity but in many cases just make it worse
 - Solution is to move to other value add services like offer normalization
- **Perception that having a unique API is a business advantage**
 - Proven many times, better function is an advantage, not the API format
- **Scarce manpower hence none to spare for community efforts**
 - Short term may be true but the savings in the long term are the better investment



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Thank You

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