The Pain

• we need budget
• to include a geolocation service
• no idea how complex or
• what effort it means
• only the specification of the API is important to us.
The Question

How can we estimate and validate the costs?
Cosmic FP on Swagger


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OpenAPI Specification and Swagger
Cosmic FP

**Functional users:**
- Humans
- Other software
- Hardware devices

**Boundary**
- 1 entering data group
- 1 exiting data group

**Functional process**
- Entry
- Exit
- Read
- Write

**Sub-processes**
- 1 retrieved data group
- 1 data group to be stored

**Persistent storage**
The Approach

OPEN API SPECIFICATION

- OpenAPI 3.0
- info
- servers
- security
- paths
- tags
- externalDocs
- components

COSMIC FP

- Functional users: Humans, Other software, Hardware devices
- Boundary
- 1 entering data group
- 1 exiting data group
- Functional process
- Entry
- Exit
- Sub-processes
- Read
- Write
- Persistent storage
- 1 retrieved data group
- 1 data group to be stored
The Approach
The Answer

Size_{functional_{\text{process}}} = \Sigma \text{Entries} + \Sigma \text{Exits} + \Sigma \text{Reads}_{\text{implicit}} + \Sigma \text{Writes}_{\text{implicit}}

- **GeographicLocation.** 2 GET
  \[ (5\text{En}+2\text{Ex}+2\text{R}+0\text{W}) \]

- **RetrieveGeographicLocation.** 1 POST and 2 GET
  \[ (6\text{En}+3\text{Ex}+2\text{R}+1\text{W}) \]

- **RetrieveLocationRelation.** 1 POST and 2 GET
  \[ (6\text{En}+3\text{Ex}+2\text{R}+1\text{W}) \]

- **Hub.** 1 POST and 1 DELETE
  \[ (2\text{En}+2\text{Ex}+0\text{R}+2\text{W}) \]

\[ \rightarrow 39\text{CFP} \times 0,07\text{PM} = 2,45 \text{ PM} \]

Dumke et al. uses the conversion key 1 CFP ≈ 0,07 PM.  
\[ \rightarrow \text{SizeLOC = 39*40.8 = 1591 LoC.} \]
The Outlook

- fast automated cost estimation
- validation of the correctness
  - automatic counting (implement a parser)
- empirical exploration
- comparisons can be made with little effort
Thank you

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