Drawings, Drawings, Everywhere!

Albert Szilvasy

Software Architect, AutoCAD

Agenda

- Quick overview of Forge Design Automation
- Demos
  - Simple json over http
  - Custom server app
  - Custom server app + viewer with custom extension

The Problem

- There are billions of DWG files “out there”
- Lot of people want DWG files
- You need AutoCAD to access/create DWGs
  - Requires HW, license, personnel to maintain

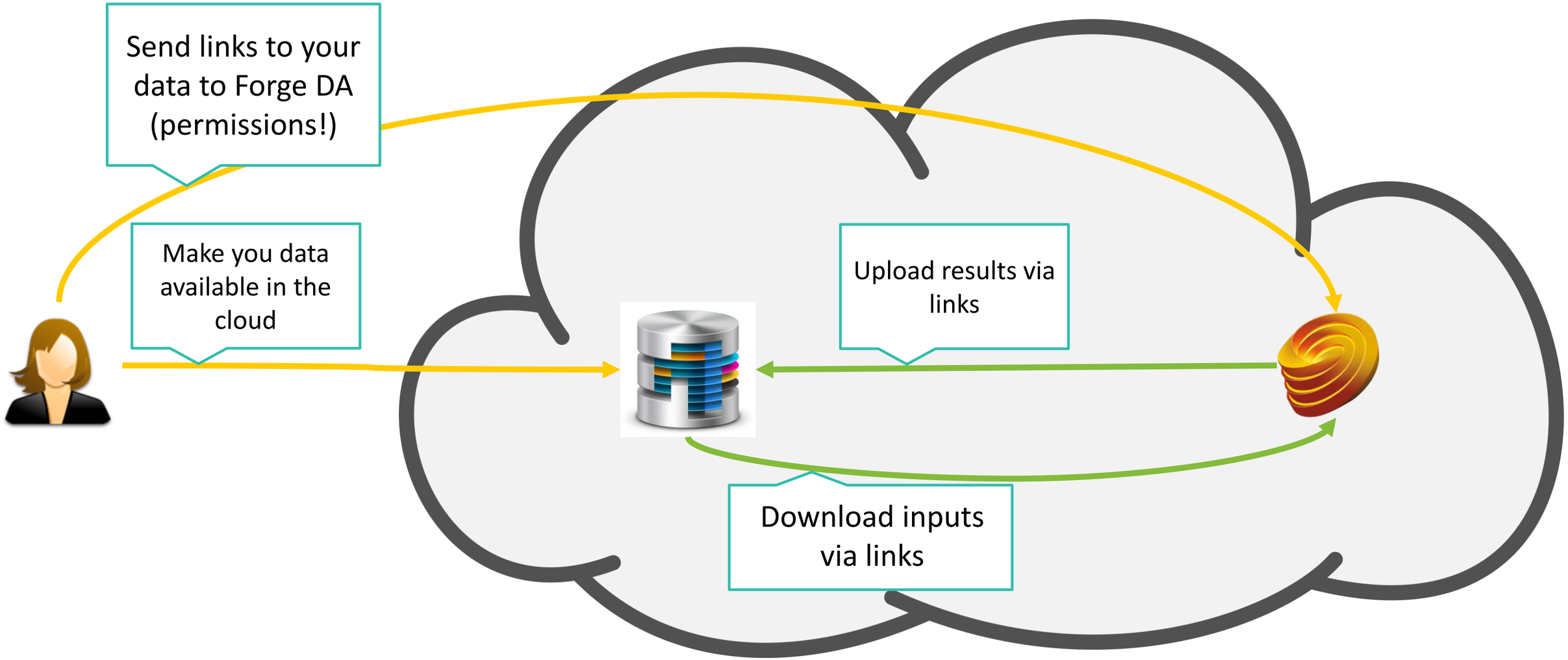
Solution: Design Automation API

- A **simple** DWG processing **service**
- **Simple**:
  - Input url(s) + output urls(s) + autocad commands
- **Service**:
  - no license, no hw, no maintance
  - Available since November 2014
  - Daily volume of over 50,000 dwgs

Similar services that you may know

- AWS Lambdas
- Google Cloud Functions
- Azure Functions

Your data at the center



The API

HTTP Endpoint	Programming concept	AutoCAD concept
/Activities	Function definition	Script file
/WorkItems	Function call	Script execution
/AppPackages	Shared library	Plugin (crx)
/Engines	Instruction set	AutoCAD version

DAA: output = **f**(input)

```
(r1, r2, r3) f(p1, p2, p3…pN) {
     inst1 p3,p2
     inst2 p1, r1
     …
}
```

Function	Activity
Input parameter	Named file
Return value (out parameter)	Named file
Instructions	AutoCAD commands
Name	Name

Activity:

- sequence of commands to execute + formal parameters/return value declaration
- **Engine**: version of AutoCAD to use
- **AppPackage**: code for custom commands

Notes on f()

- **Activities** are like functions. They are stored and reusable. Create once use many times.
- **AppPackages** are like shared libraries. They are stored and reusable. Upload once use many times.
- **Engines** are like CPU architectures. Clients can enumerate them.

DAA: output = f(input)

```
var v = f(https://xyz, https://qfq, https://lsf )
```

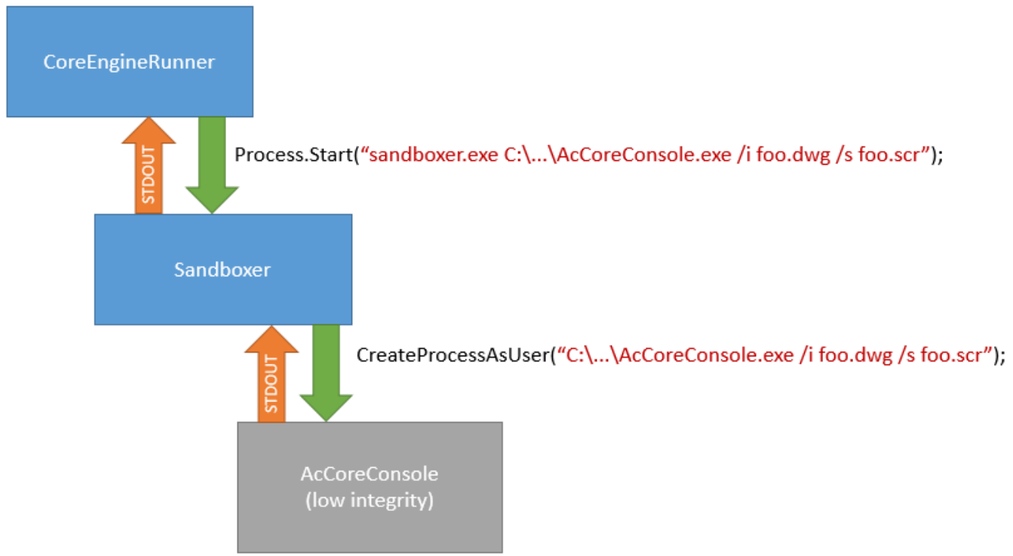
- **WorkItem**:
  - invoke f() with concrete input/output arguments (URLs + headers). A function call.
  - Input/outputs are NOT stored, they are downloaded/processed and THROWN AWAY

Behind the scenes

1. Worker receives WorkItem via a queue
2. Downloads input arguments
   - HTTP GET
3. Run AcCoreConsole.exe in sandbox
4. Uploads result to output arguments
   - HTTP POST/PUT

Sandboxing

- Takes advantage of Windows Integrity Levels
- Write access to working folder only
- All network i/o is blocked



External reference handling

DWG files can reference other files (dwg, image etc.)

- Client must supply all references
  - Etransmit package
  - Inline ‘File’ objects in the input argument (JSON that describes the URLs and their local name)
- Sample:
  - https://github.com/Developer-Autodesk/design.automation-.net-input.output.sample

Limits and Quotas

Per application:

1. 744 hours of processing time per calendar month
2. 5 requests per minute

Per workitem:

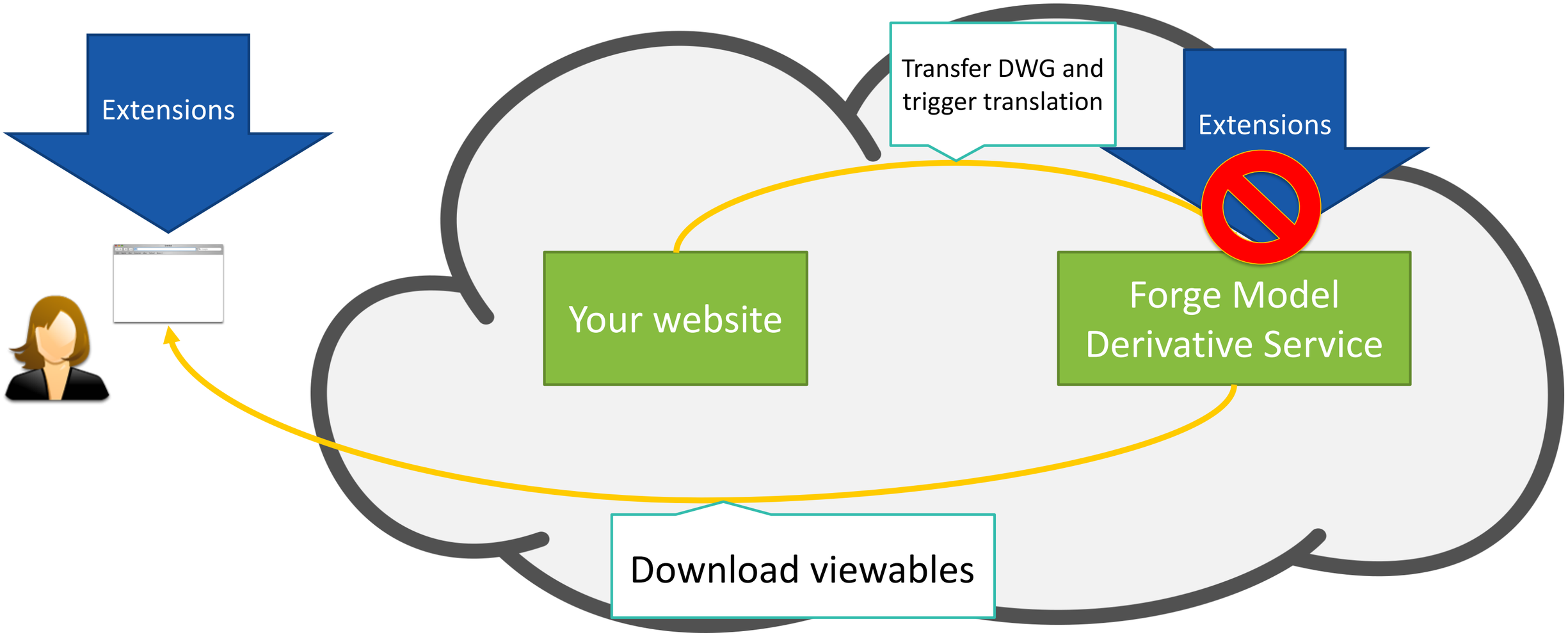
1. Total time downloading input files cannot exceed 3 minutes.
2. Total time uploading output files cannot exceed 3 minutes.
3. The number of input files cannot exceed 30.
4. The number of output files cannot exceed 30.
5. The total amount of input cannot exceed 30,000,000 bytes
6. The total amount of output cannot exceed 30,000,000 bytes
7. Processing time without heartbeat cannot exceed 1 minute.
8. Total processing time cannot exceed 5 minutes

Demo One: PDF plotting to various storage places.

Demo Two: Running your custom code.

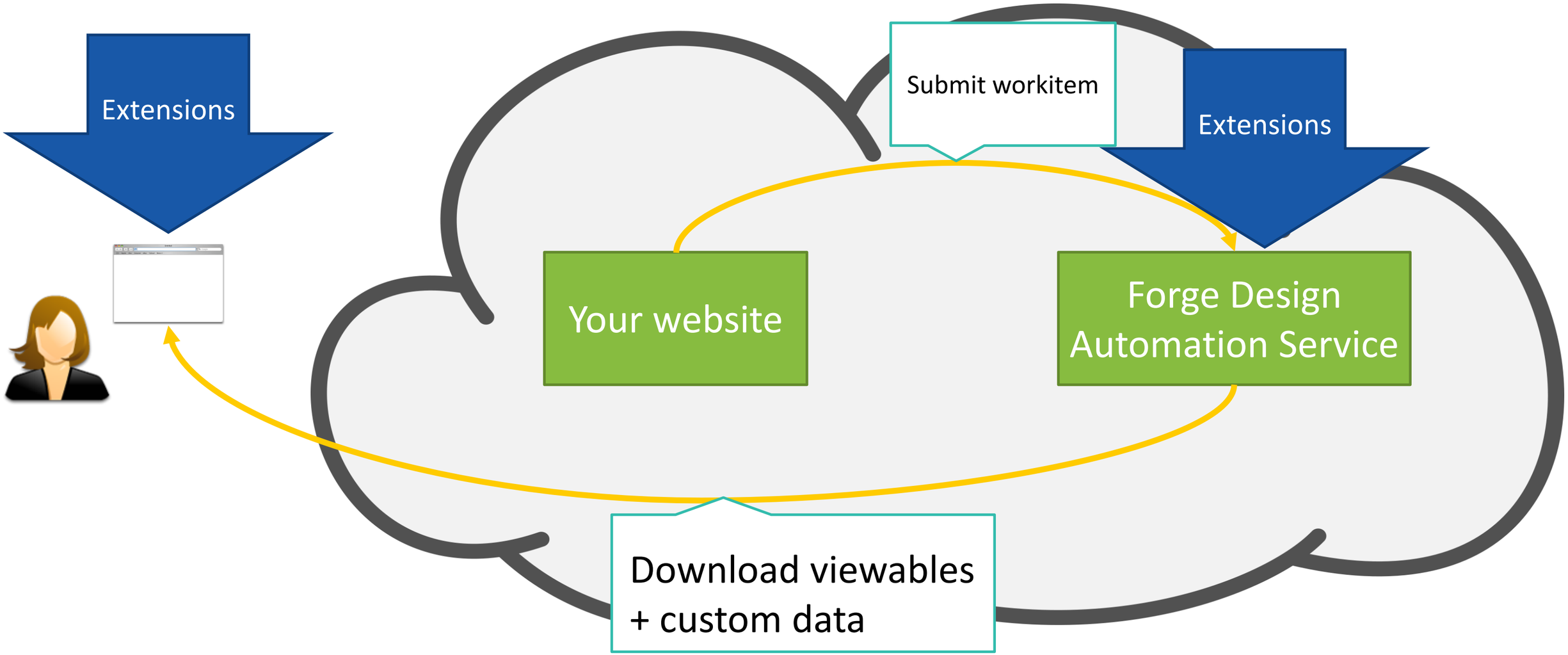
https://github.com/Developer-Autodesk/design.automation-.net-custom.activity.sample

Demo Three: DA + Viewer with custom app on both sides



https://github.com/Developer-Autodesk/design.automation-custom-data-viewer

Demo Three: DA + Viewer with custom app on both sides



https://github.com/Developer-Autodesk/design.automation-custom-data-viewer

Resources

- API Documentation
- Support
- Tutorials
- Samples

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