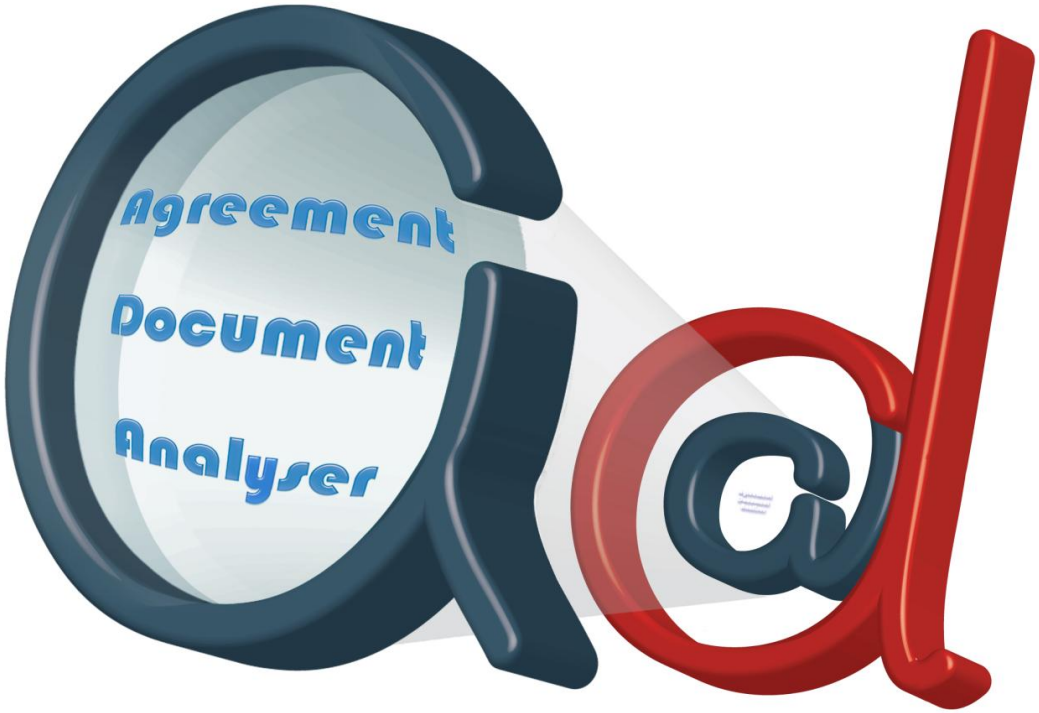
Speakers: Carlos Müller & Manuel Resinas

ADA: Analysing WS-Agreement documents



Who are we?

Applied
Software Engineering
Research Group
www.isa.us.es

Topics:

- Service Oriented Computing
- Software Product Lines
- Business Processes Management
- Requirement Engineering

Team:

- 7 Phd
- 10 Phd-Students
- 5 Tech Staff

Antonio Ruiz Cortés
(ISA group leader)

Who are we?

ADA
www.isa.us.es/ada

Topics:

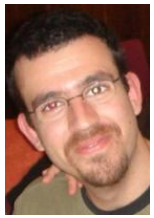
- SLA Analysis
- Automated Negotiation

Team:

- 4 Phd
- 2 Phd-Students
- 1 Tech Staff

Antonio Ruiz-Cortés

Octavio Martín-Díaz



Manuel Resinas

Amador Durán

Carlos Müller

Jesús García-Galán

Antonio Jurado

UNIVERSIDAD D SEVILLA

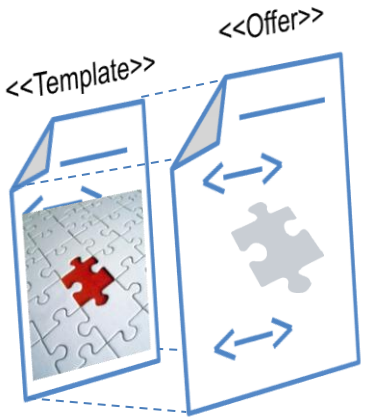
Talk Goals

1. Introducing ADA

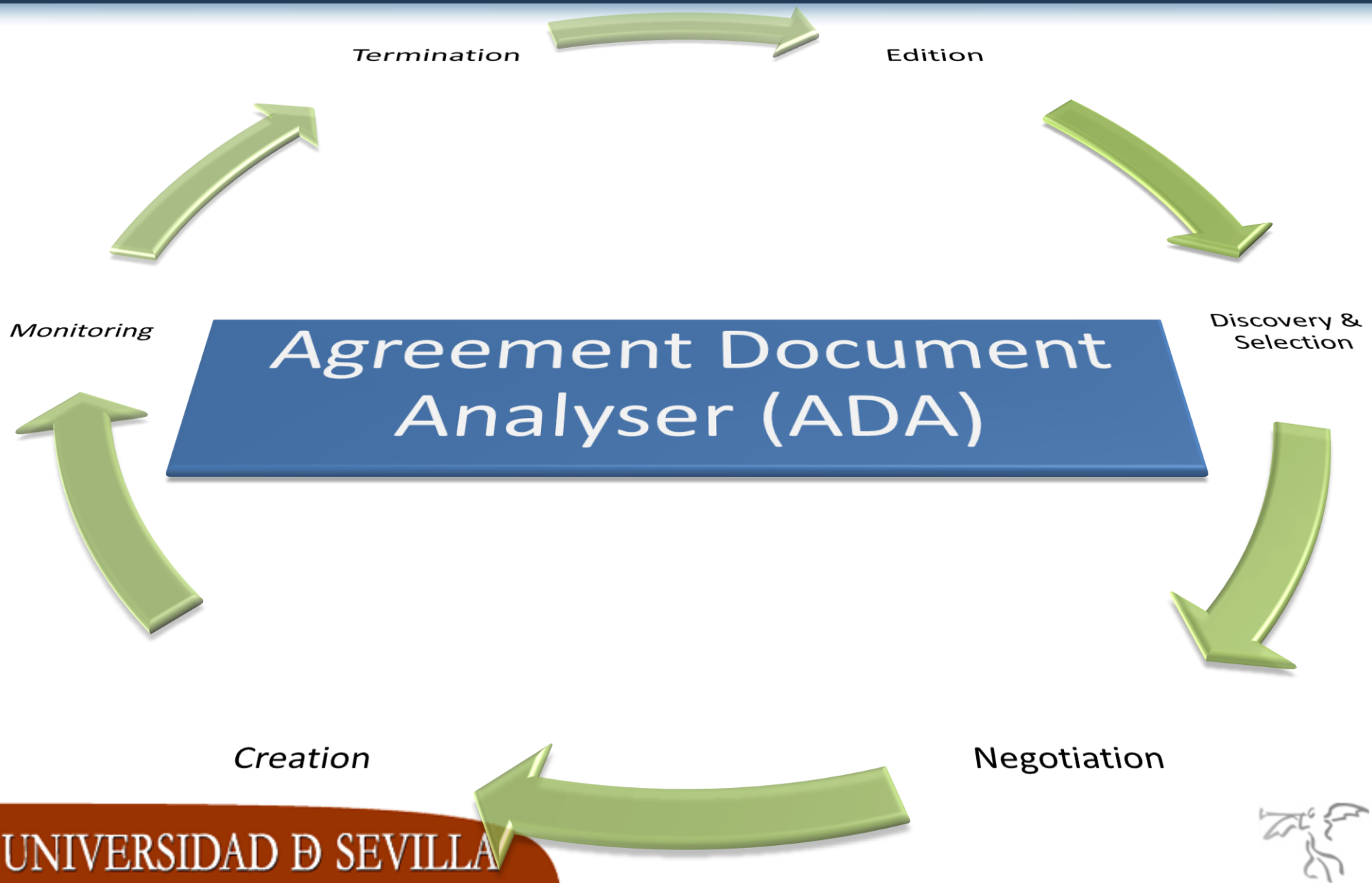
- Conception
- Structure
- Validation

2. Our experience with WS-Agreement

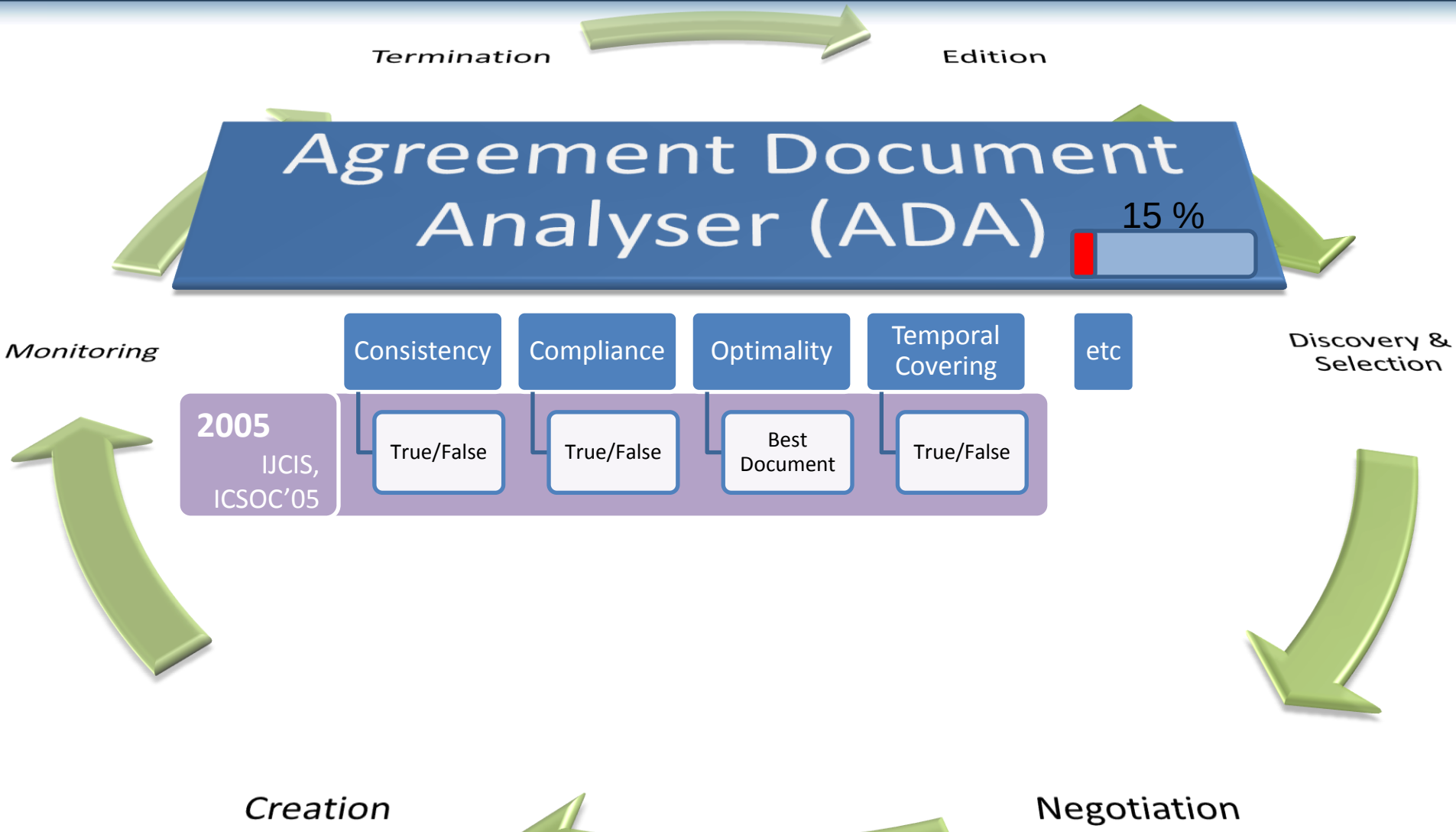
- Constructs used
- Languages Choices
- Lessons learned



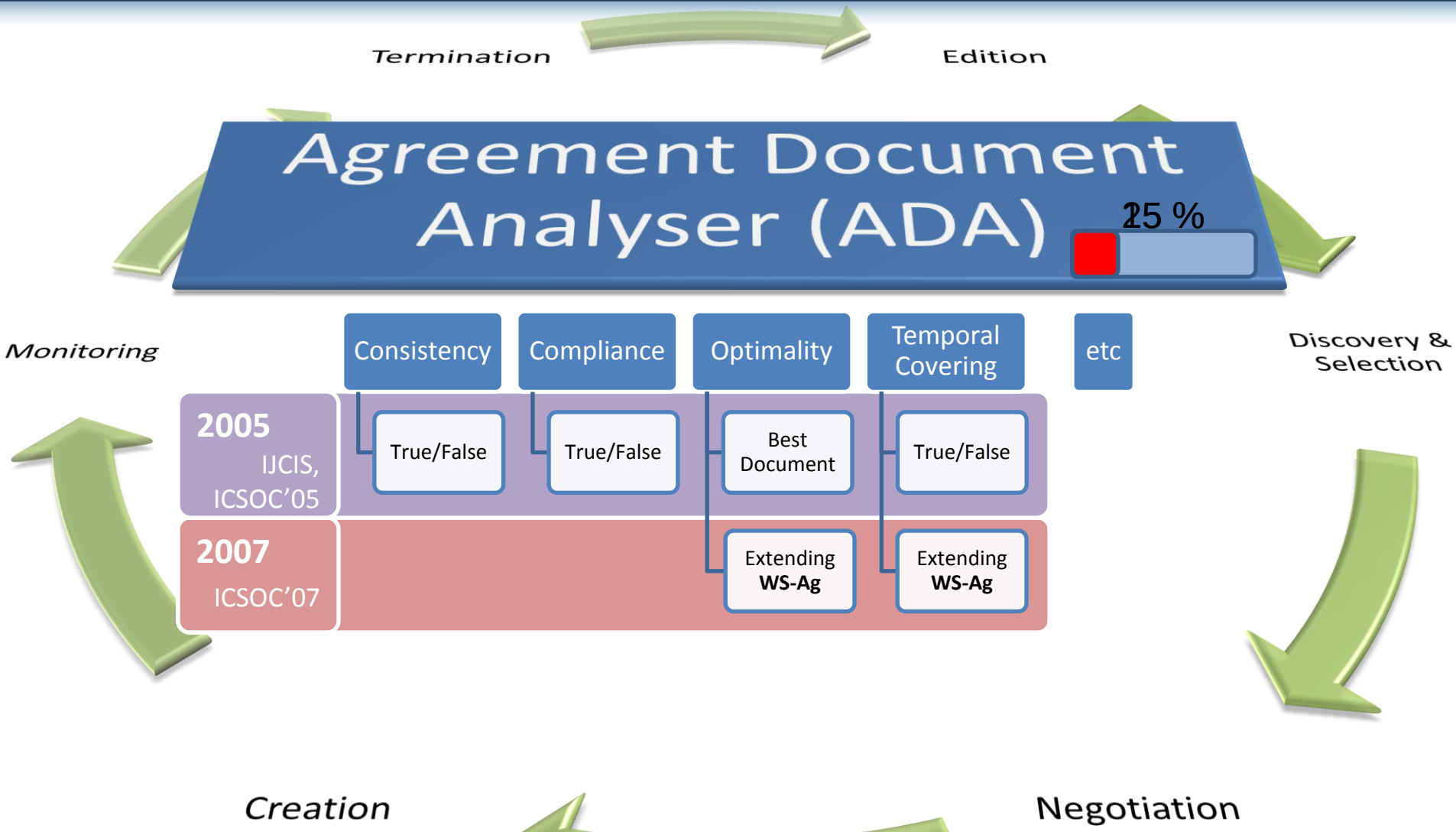
ADA Conception



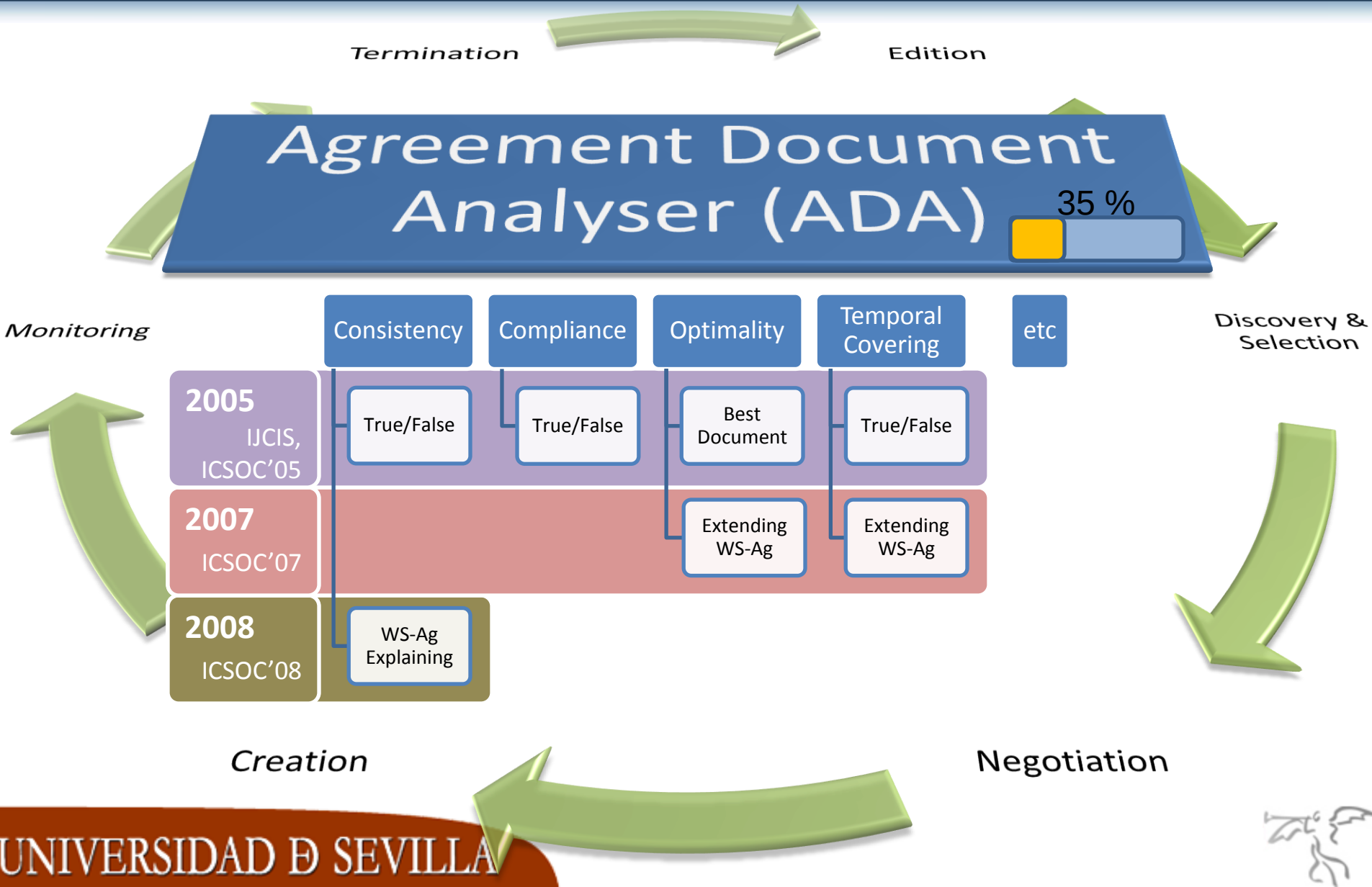
ADA Conception



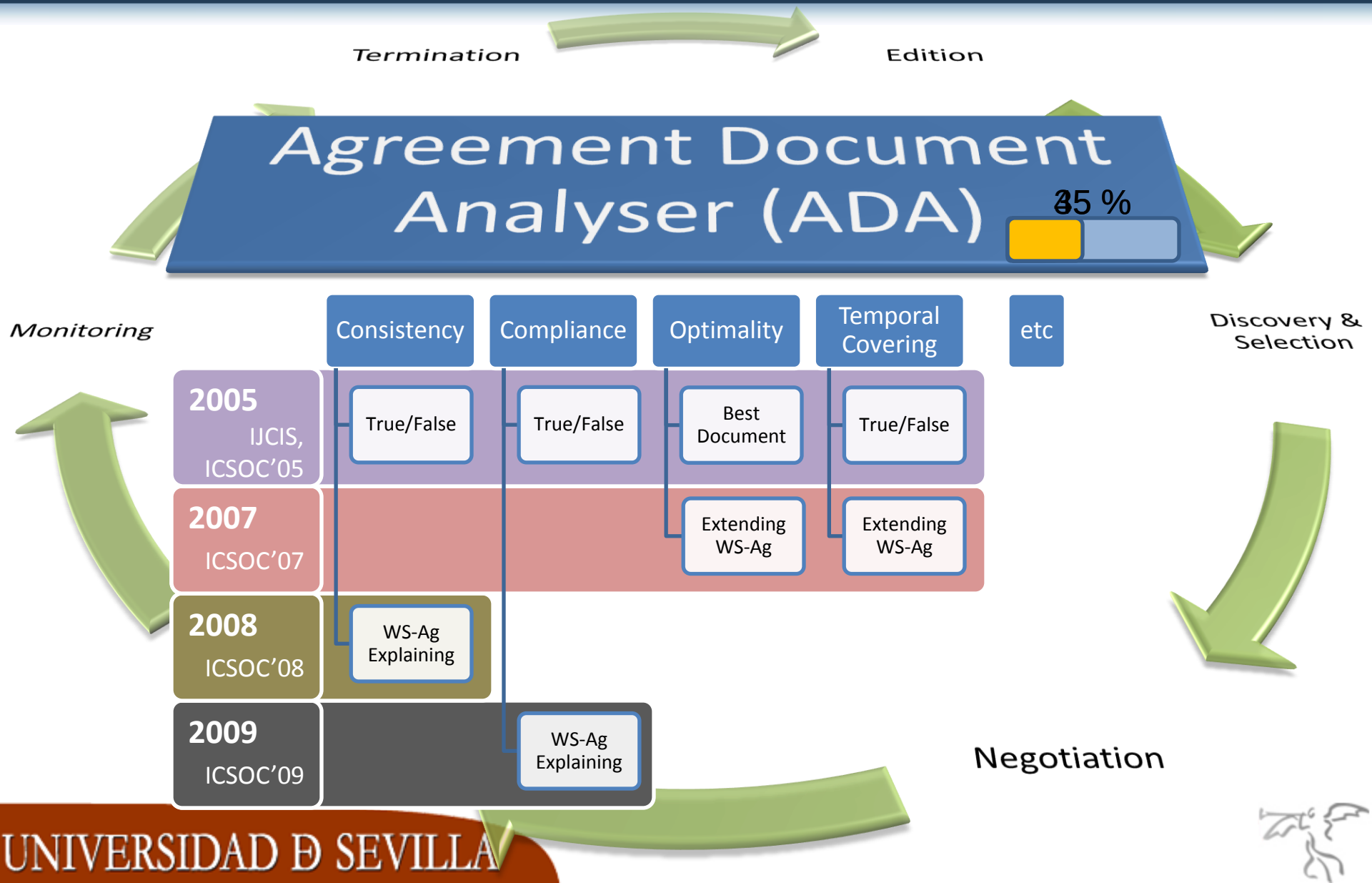
ADA Conception



ADA Conception

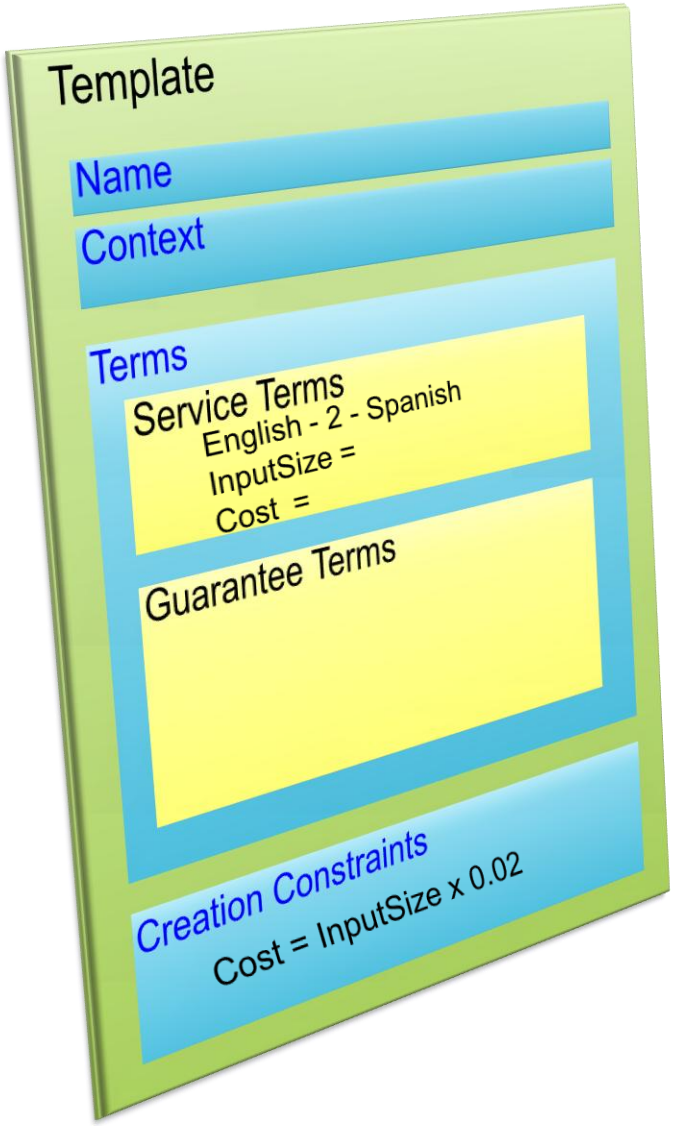


ADA Conception



Basic examples

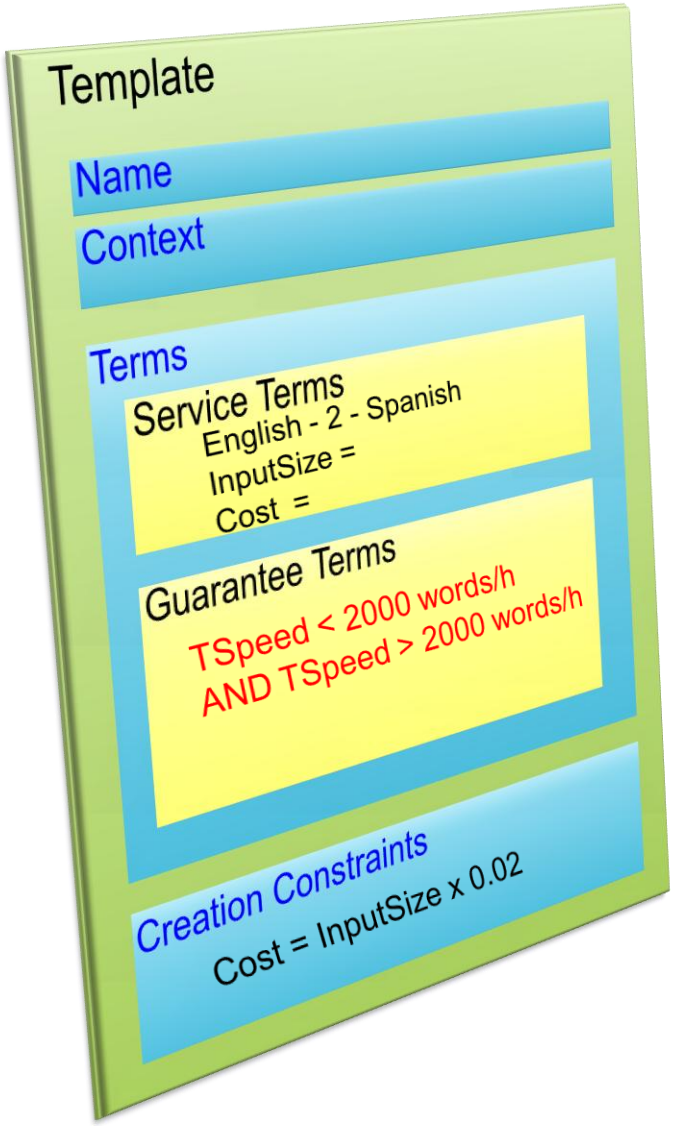
Conflicts (1 WS-Ag doc):



Basic examples

Conflicts (1 WS-Ag doc):

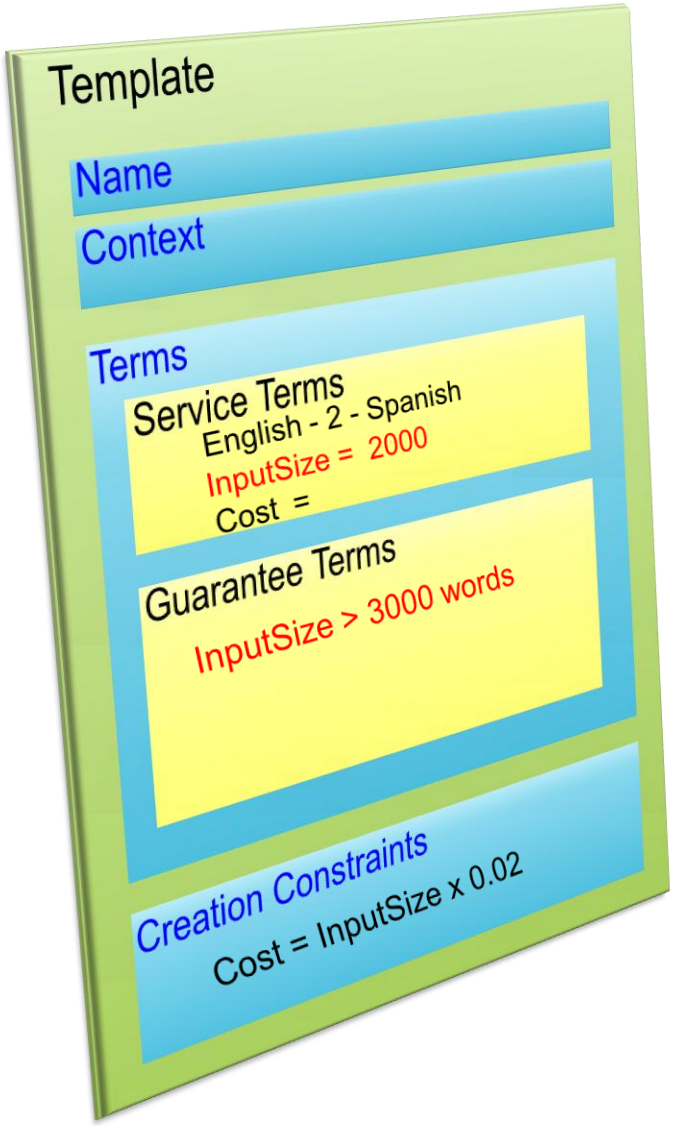
- **Inconsistency Terms**



Basic examples

Conflicts (1 WS-Ag doc):

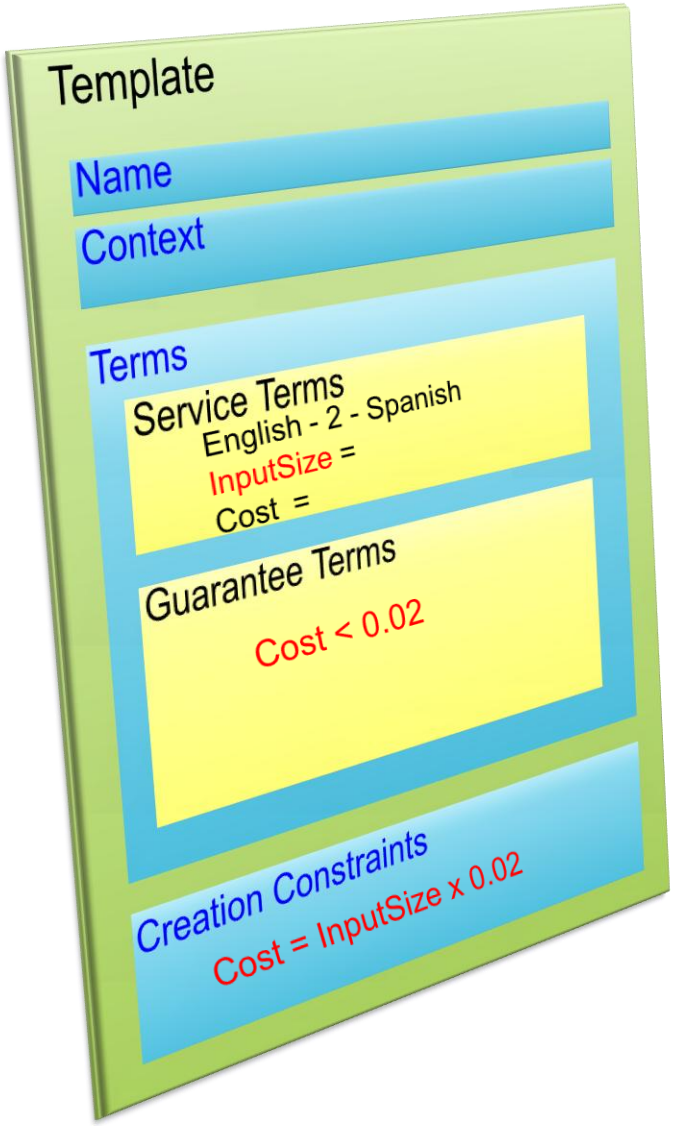
- **Inconsistency Terms**



Basic examples

Conflicts (1 WS-Ag doc):

- **Inconsistency Terms**



Basic examples

Conflicts (1 WS-Ag doc):

- Inconsistency Terms
- Dead Terms

Basic examples

Conflicts (1 WS-Ag doc):

- Inconsistency Terms
- Dead Terms

Basic examples

Conflicts (1 WS-Ag doc):

- Inconsistency Terms
- Dead Terms
- Ludicrous Terms

Basic examples

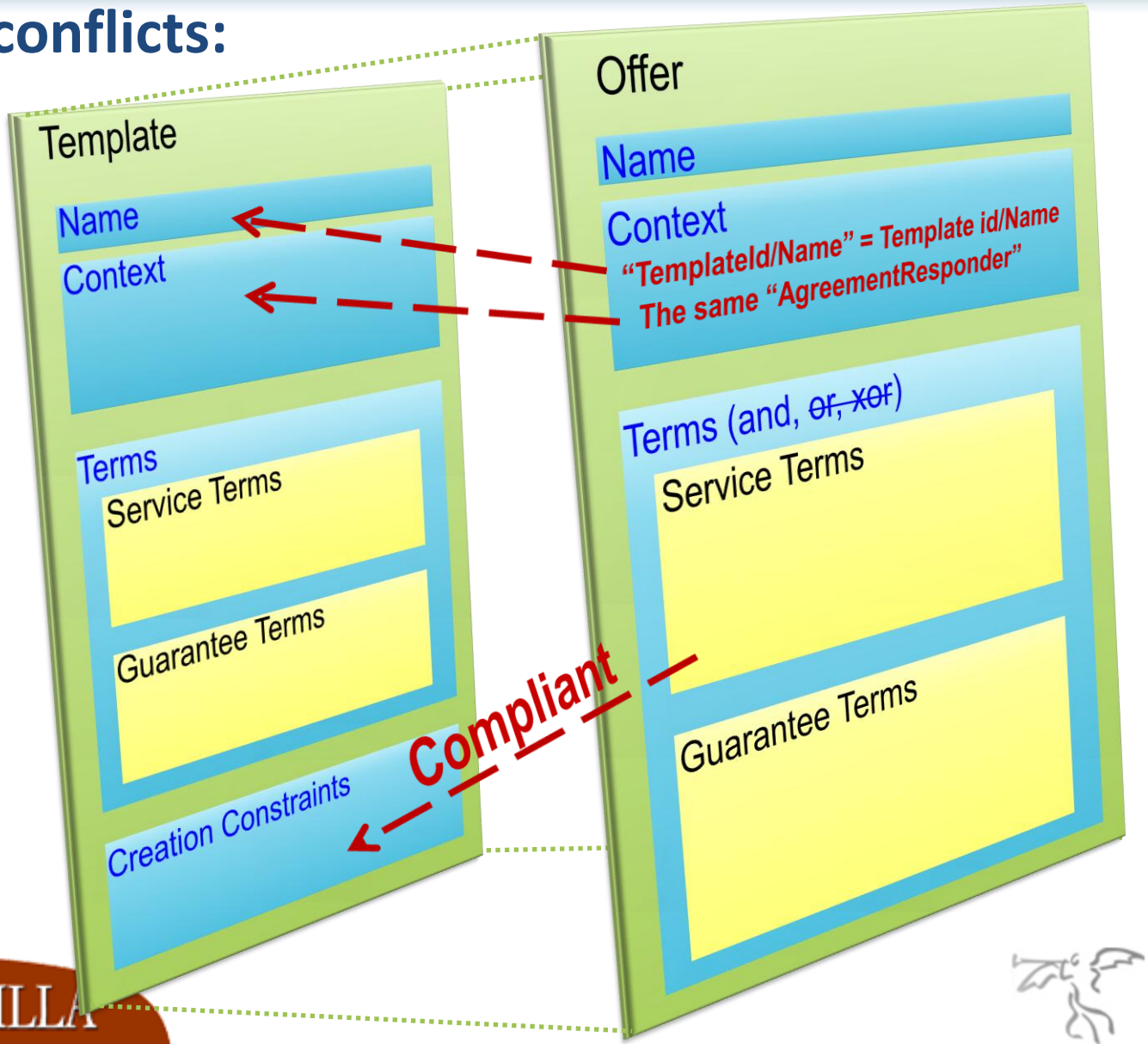
Conflicts (1 WS-Ag doc):

- Inconsistency Terms
- Dead Terms
- Ludicrous Terms

Basic examples

Non-Compliance conflicts:

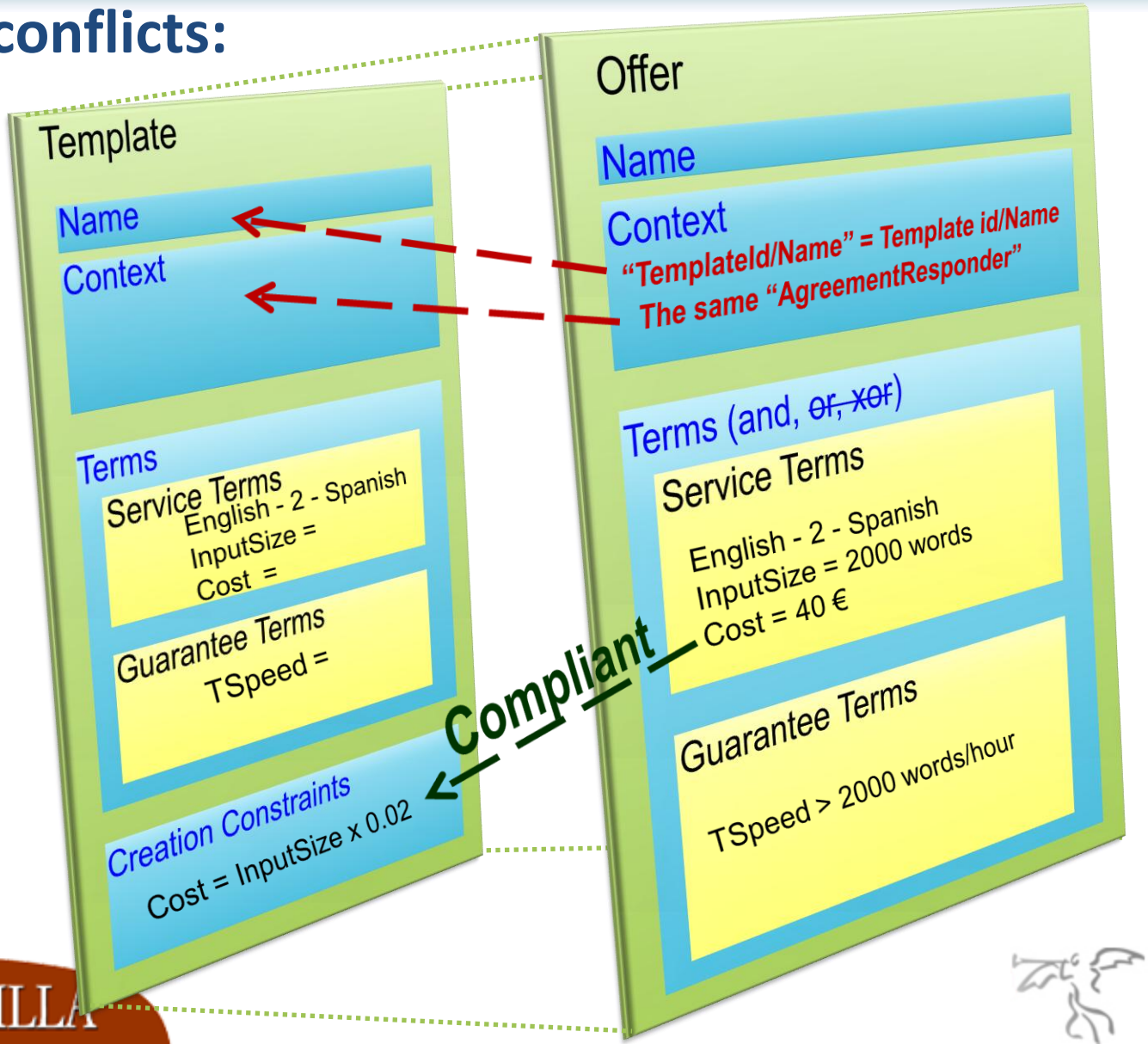
- WS-Agreement Compliance definition



Basic examples

Non-Compliance conflicts:

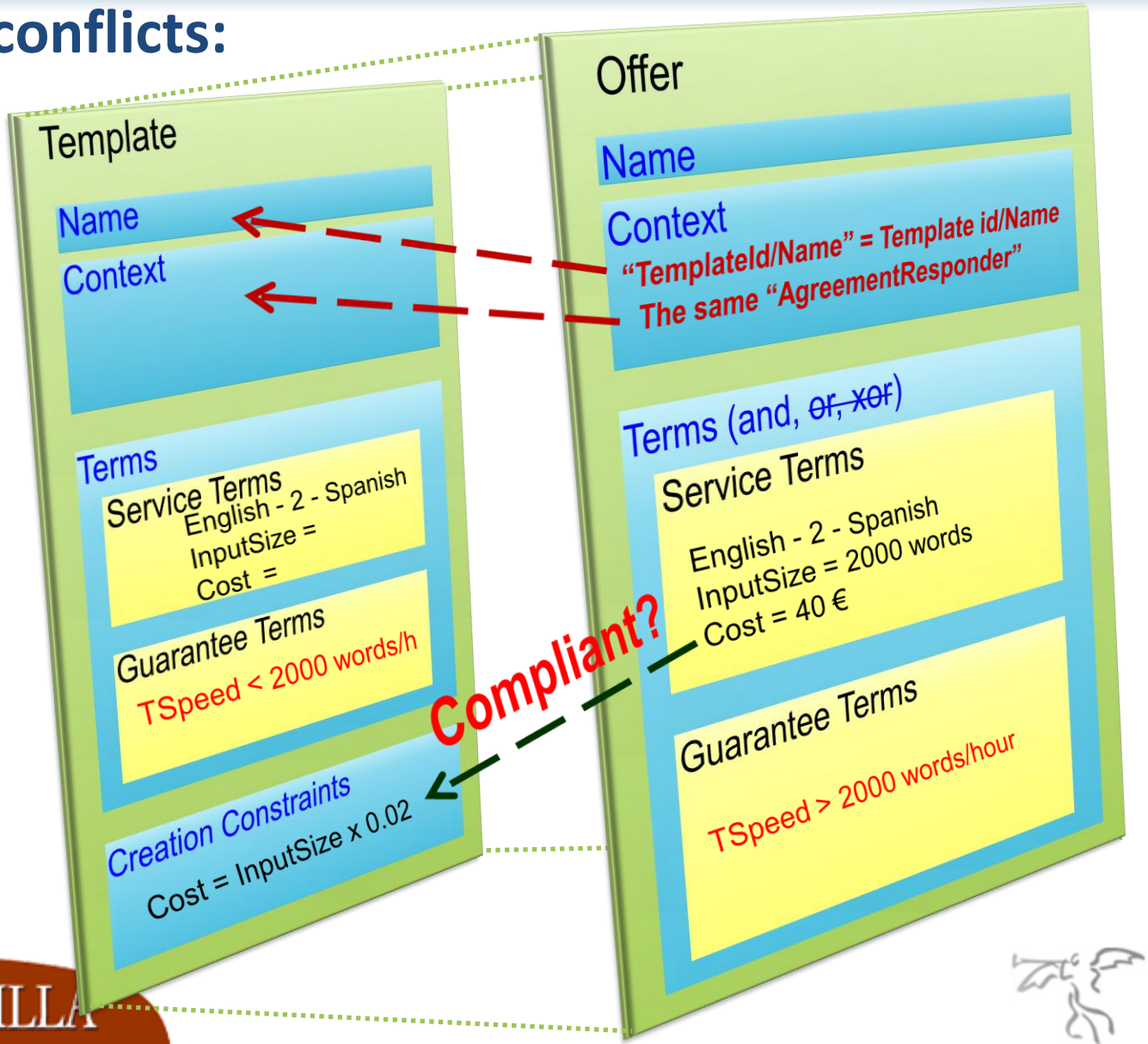
- WS-Agreement Compliance definition



Basic examples

Non-Compliance conflicts:

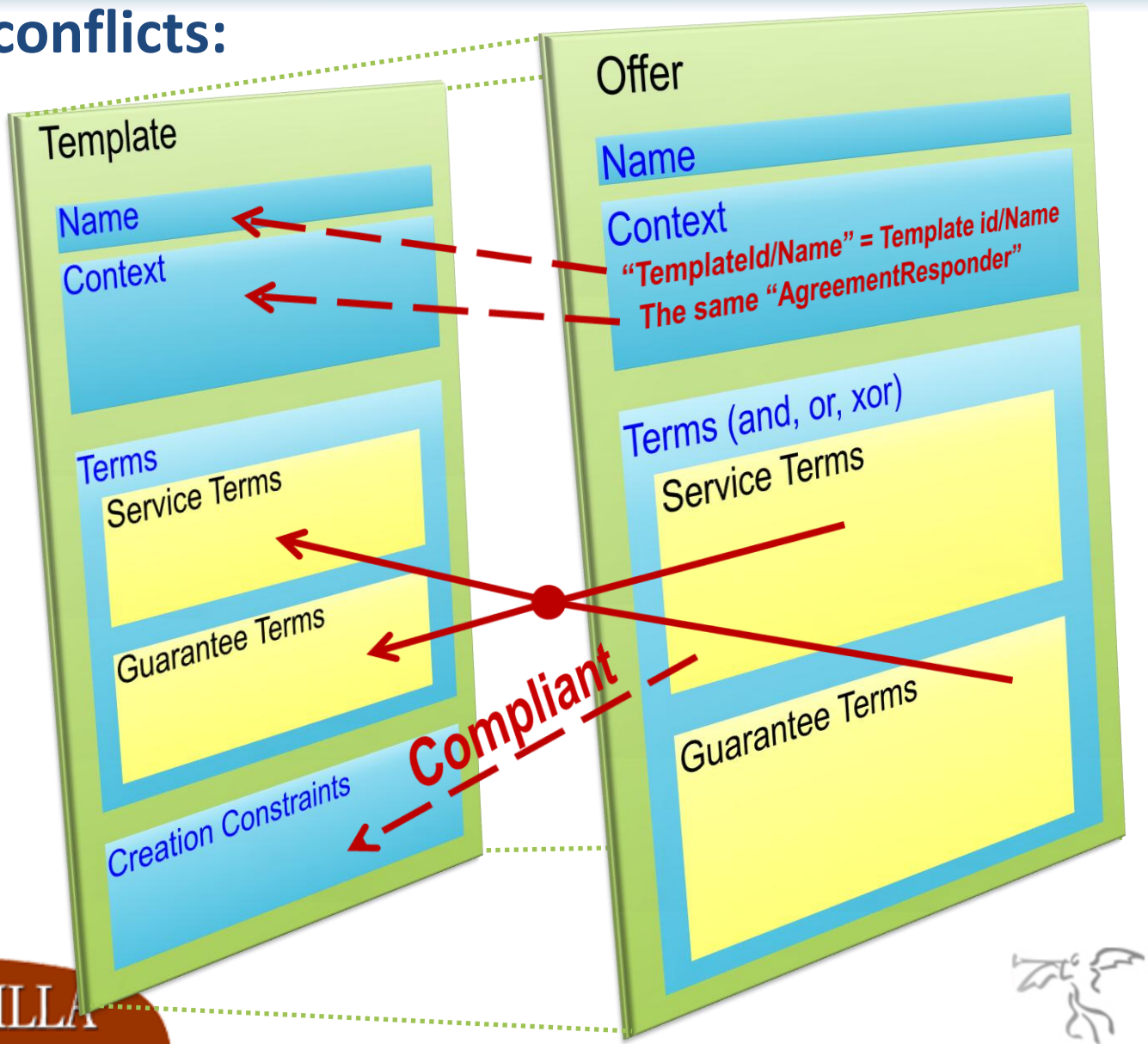
- WS-Agreement Compliance definition



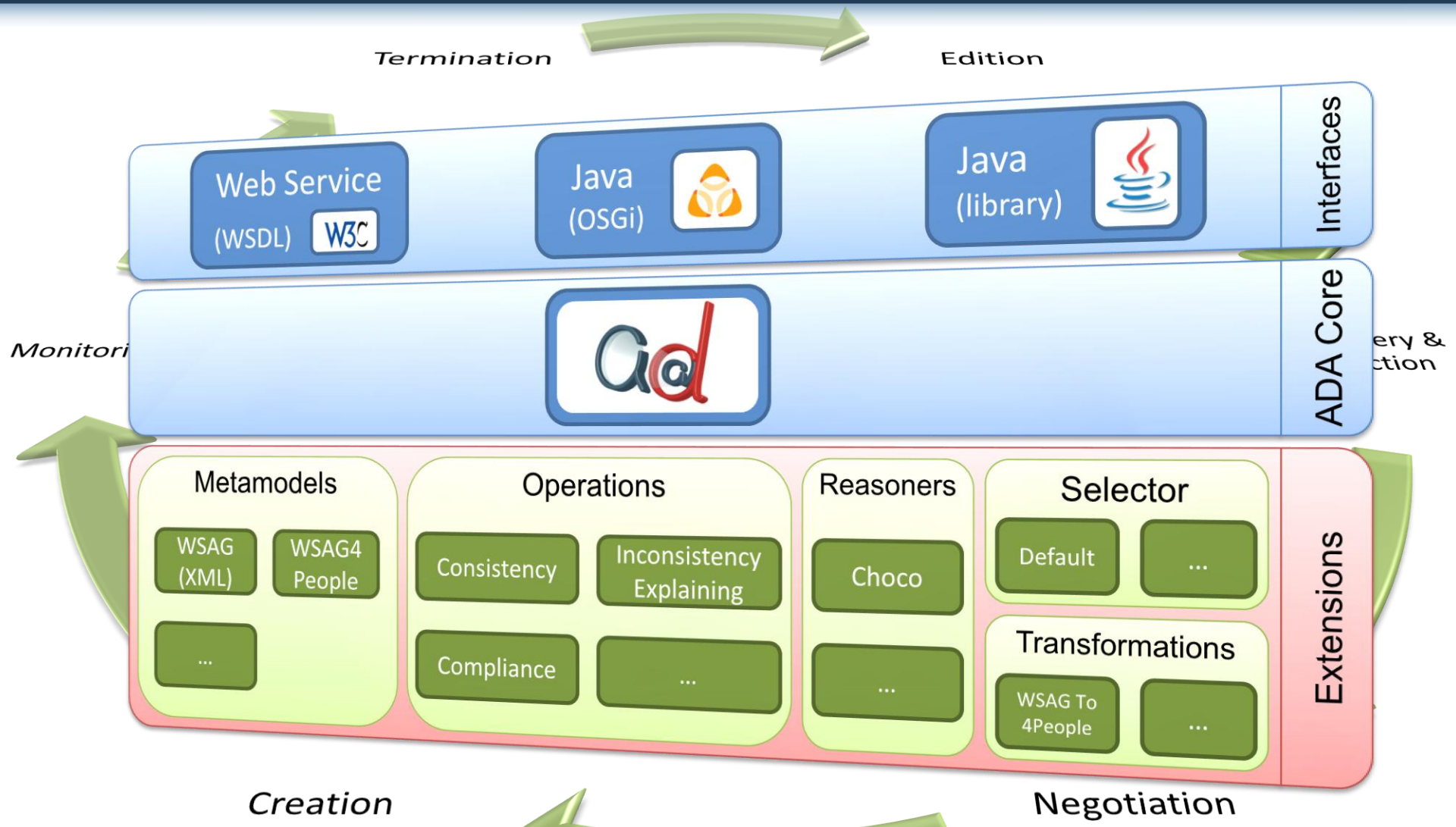
Basic examples

Non-Compliance conflicts:

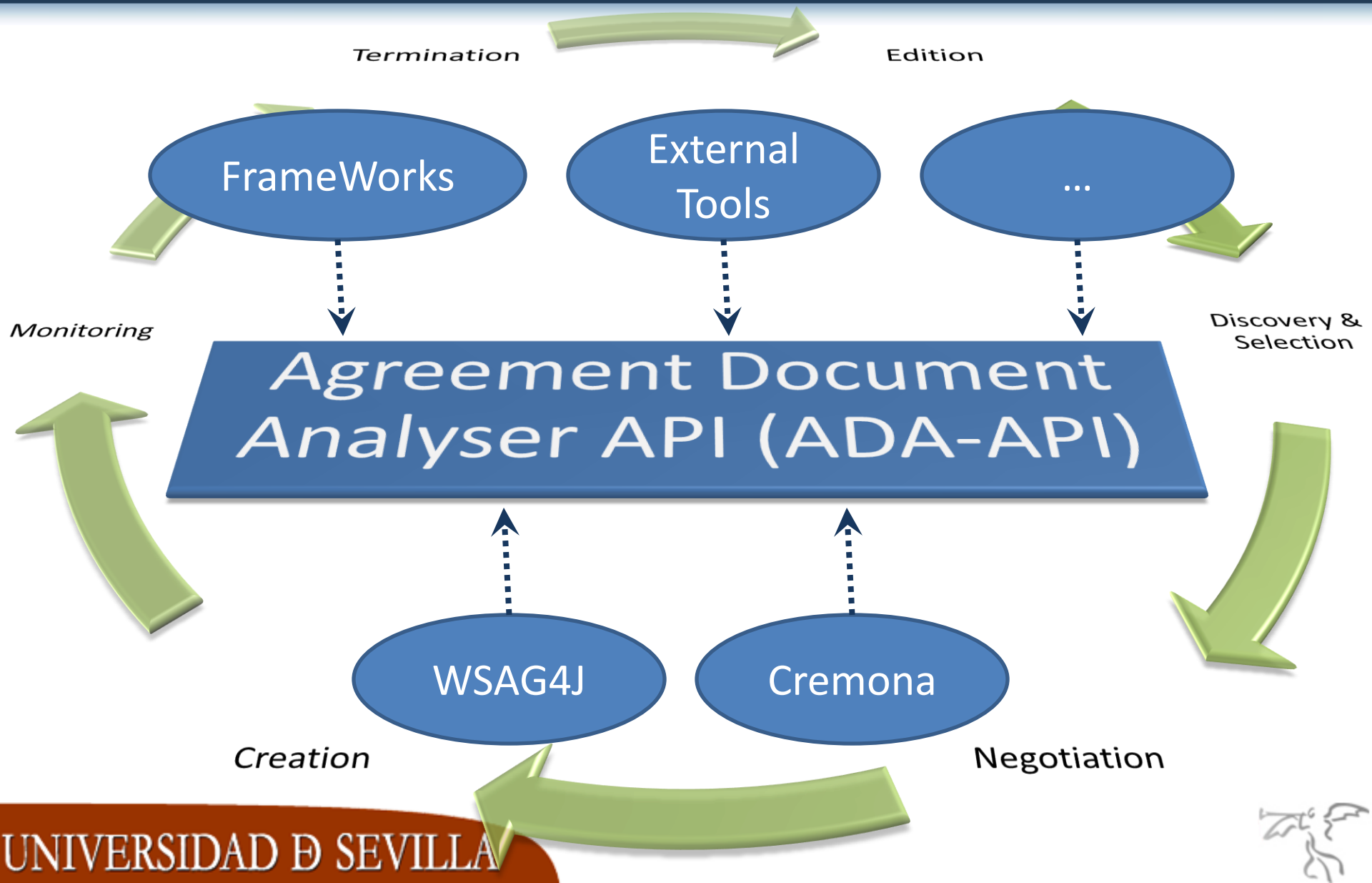
- WS-Agreement Compliance definition
- **Extending** WS-Agreement Compliance definition



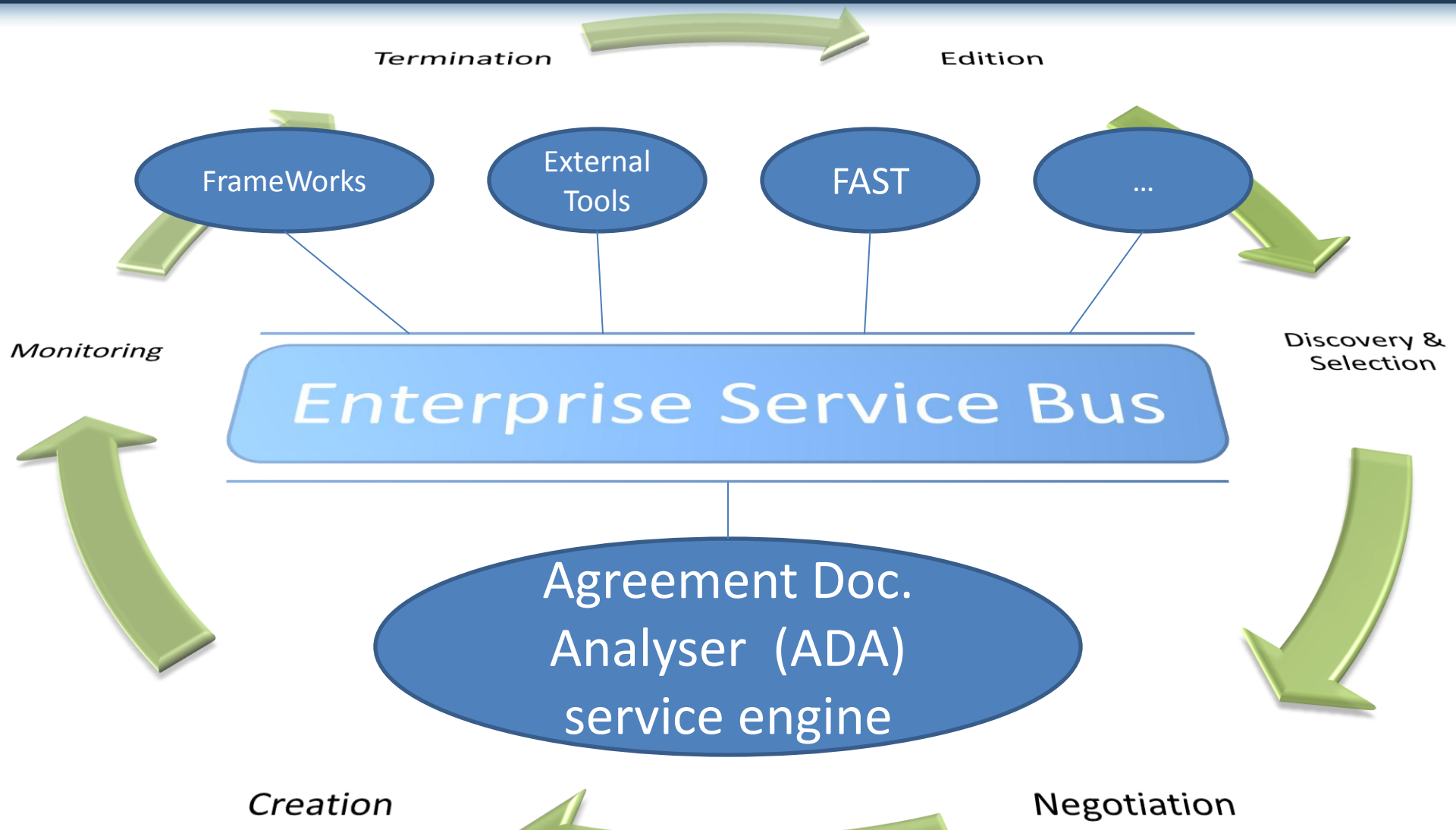
ADA an industry-ready FW



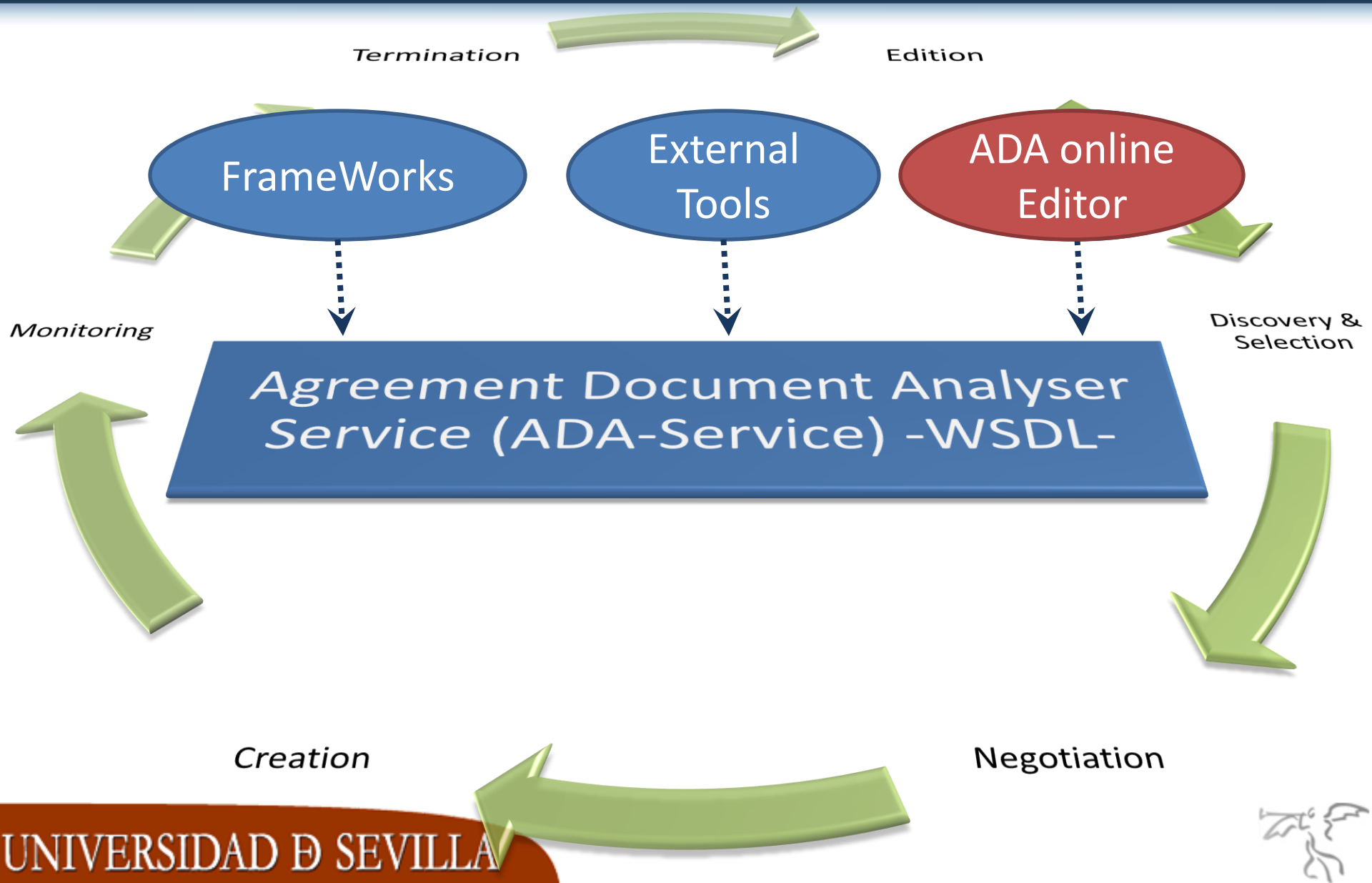
Using ADA (option 1): *ADA-API*



Using ADA (option 2): *ServiceEngine*

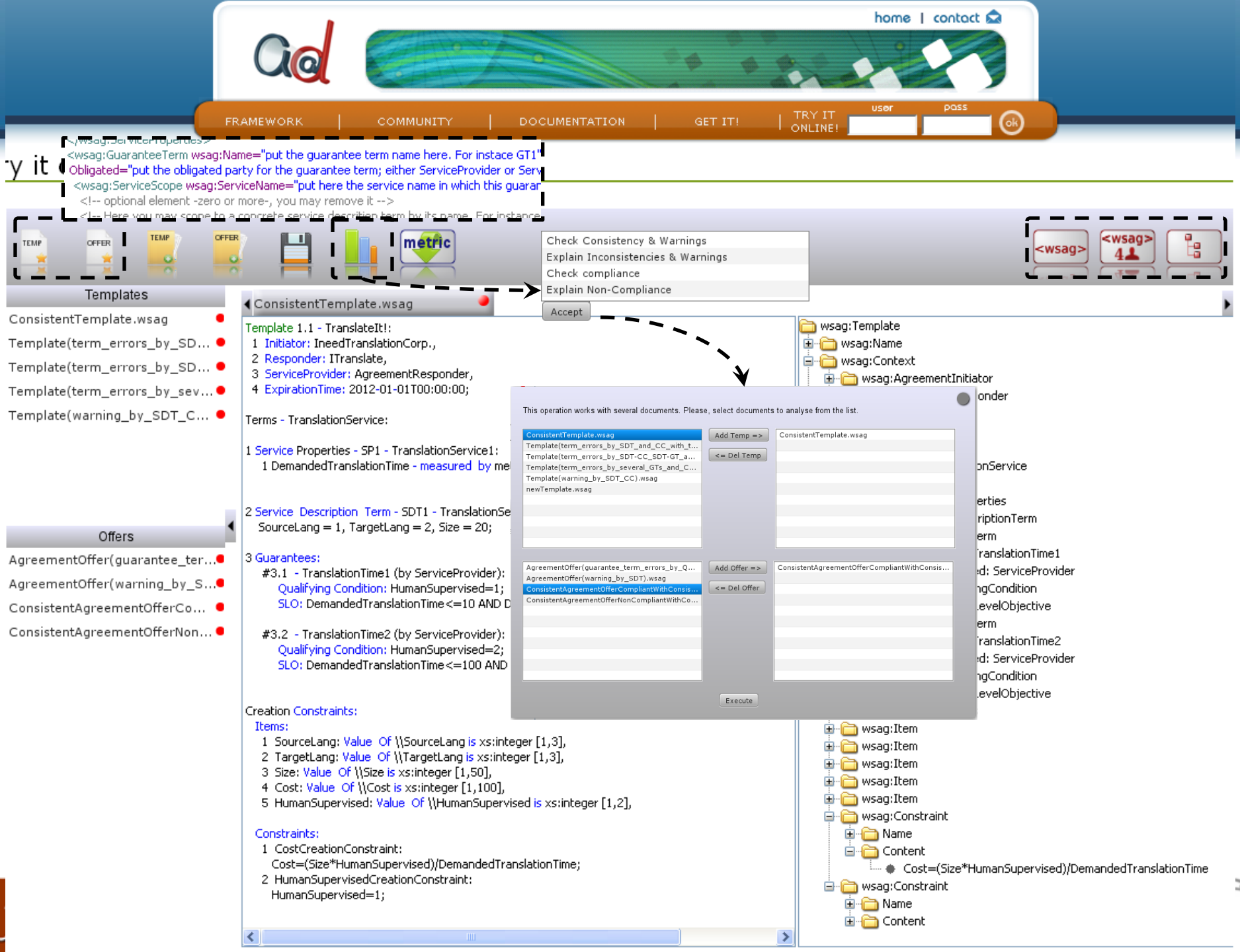


ADA Validation: *ADA-Service*



ADA Validation: *ADA-Service*

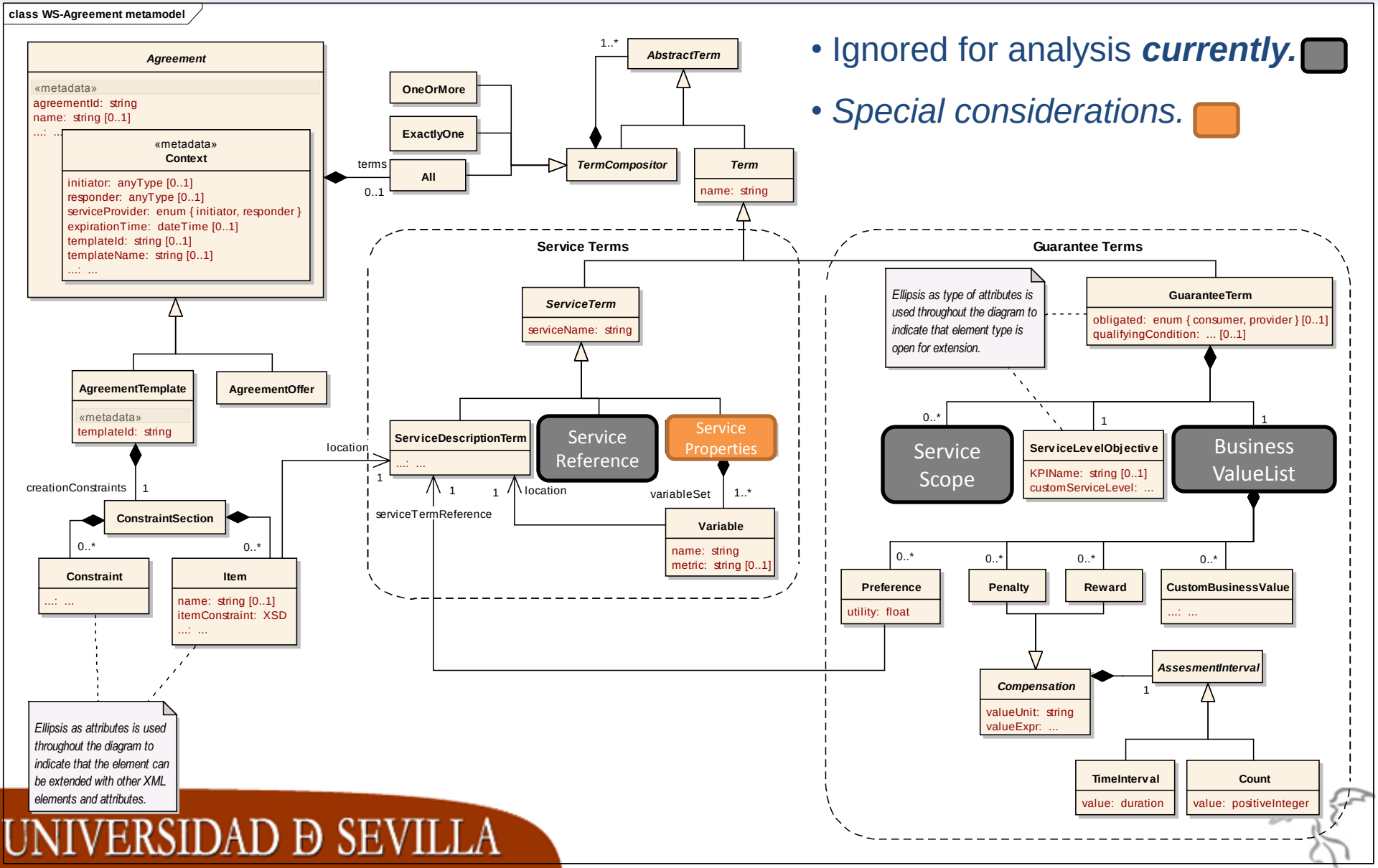
On-line editor (ADA front end) at www.isa.us.es/ada


home | contact
FRAMEWORK
COMMUNITY
DOCUMENTATION
GET IT!
TRY IT ONLINE!
user
pass
<wsag:GuaranteeTerm wsag:Name="put the guarantee term name here. For instace GT1"
Obligated="put the obligated party for the guarantee term; either ServiceProvider or Serv
<wsag:ServiceScope wsag:ServiceName="put here the service name in which this guaran
<!-- optional element -zero or more-, you may remove it -->
TEMP
OFFER
TEMP
OFFER
metric
Check Consistency & Warnings
Explain Inconsistencies & Warnings
Check compliance
Explain Non-Compliance
Accept
<wsag>
<wsag>
Templates
ConsistentTemplate.wsag
Template(term_errors_by_SD...
Template(term_errors_by_SD...
Template(term_errors_by_sev...
Template(warning_by_SDT_C...
Offers
AgreementOffer(guarantee_ter...
AgreementOffer(warning_by_S...
ConsistentAgreementOfferCo...
ConsistentAgreementOfferNon...
ConsistentTemplate.wsag
Template 1.1 - TranslateIt!:
1 Initiator: IneedTranslationCorp.,
2 Responder: ITranslate,
3 ServiceProvider: AgreementResponder,
4 ExpirationTime: 2012-01-01T00:00:00;
Terms - TranslationService:
1 Service Properties - SP1 - TranslationService1:
1 DemandedTranslationTime - measured by me
2 Service Description Term - SDT1 - TranslationSe
SourceLang = 1, TargetLang = 2, Size = 20;
3 Guarantees:
#3.1 - TranslationTime1 (by ServiceProvider):
Qualifying Condition: HumanSupervised=1;
SLO: DemandedTranslationTime<=10 AND D
#3.2 - TranslationTime2 (by ServiceProvider):
Qualifying Condition: HumanSupervised=2;
SLO: DemandedTranslationTime<=100 AND
Creation Constraints:
Items:
1 SourceLang: Value Of \\SourceLang is xs:integer [1,3],
2 TargetLang: Value Of \\TargetLang is xs:integer [1,3],
3 Size: Value Of \\Size is xs:integer [1,50],
4 Cost: Value Of \\Cost is xs:integer [1,100],
5 HumanSupervised: Value Of \\HumanSupervised is xs:integer [1,2],
Constraints:
1 CostCreationConstraint:
Cost=(Size*HumanSupervised)/DemandedTranslationTime;
2 HumanSupervisedCreationConstraint:
HumanSupervised=1;
This operation works with several documents. Please, select documents to analyse from the list.
ConsistentTemplate.wsag
Template(term_errors_by_SDT_and_CC_with_t...
Template(term_errors_by_SDT-CC_SDT-GT_a...
Template(term_errors_by_several_GTs_and_C...
Template(warning_by_SDT_CC).wsag
newTemplate.wsag
Add Temp =>
<= Del Temp
ConsistentTemplate.wsag
AgreementOffer(guarantee_term_errors_by_Q...
AgreementOffer(warning_by_SDT).wsag
ConsistentAgreementOfferCompliantWithConsis...
ConsistentAgreementOfferNonCompliantWithCo...
Add Offer =>
<= Del Offer
ConsistentAgreementOfferCompliantWithConsis...
Execute
wsag:Template
wsag:Name
wsag:Context
wsag:AgreementInitiator
wsag:Item
wsag:Item
wsag:Item
wsag:Item
wsag:Item
wsag:Constraint
Name
Content
Cost=(Size*HumanSupervised)/DemandedTranslationTime
wsag:Constraint
Name
Content

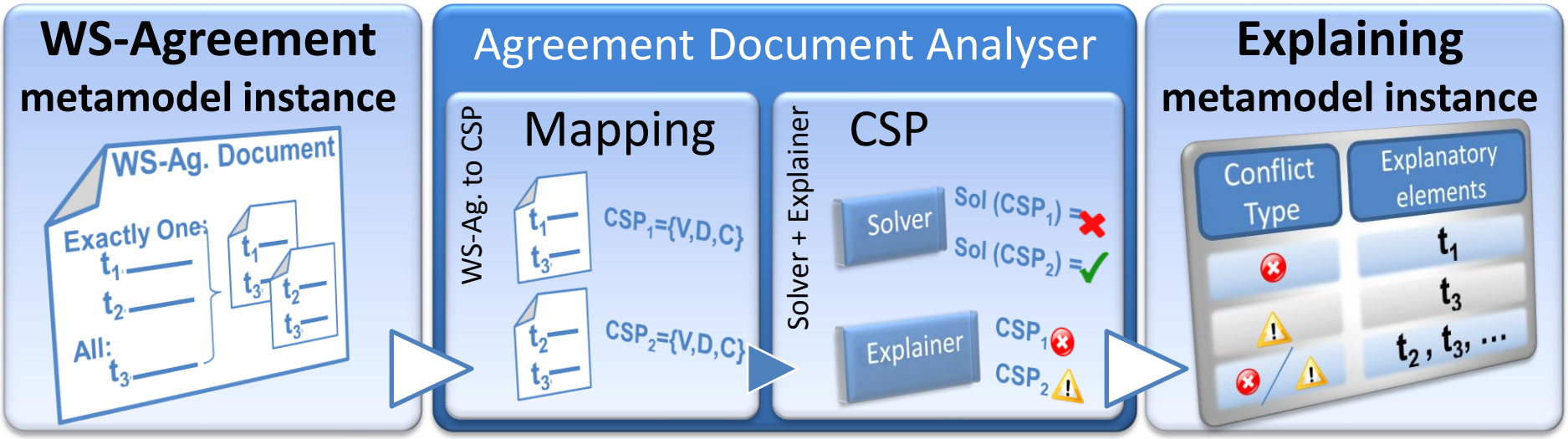
ADA Validation (in progress)

- **Andalusia local goverment (FAST)**
  - **ADA-ServiceEngine**
- **LASS-ADA validation (Trento)**
  - **License Aware Service Selection FW**
- **WSAG4J-ADA integration (Fraunhofer)**
- **Negotiation-ADA paper (Fraunhofer)**

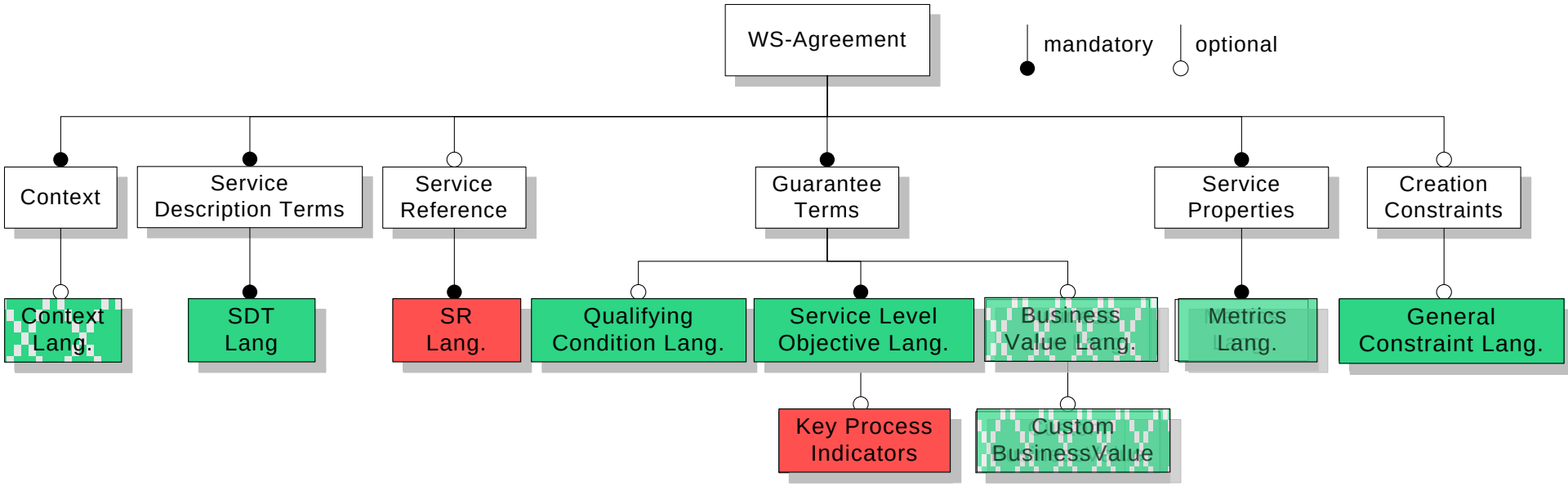
Constructs used



- Ignored for analysis ***currently.***
- *Special considerations.*


WS-Agreement
metamodel instance
WS-Ag. Document
Exactly One:
All:
Agreement Document Analyser
WS-Ag. to CSP
Mapping
CSP1={V,D,C}
CSP2={V,D,C}
Solver + Explainer
CSP
Solver
Sol (CSP1)
Sol (CSP2)
Explainer
CSP1
CSP2
Explaining
metamodel instance
Conflict Type
Explanatory elements

Languages Choices in ADA



We establish abstract models for:

- **Mandatory elements**
- **Most of optional elements**

Languages Choices in ADA

- To **describe a service**, in an abstract way:
  - Attribute–value **pairs**
  - Attribute domain

Supports: Any XML doc. that can be flattened to att-value pairs with domains in XMLSchema (JSDL,WSDL, BPEL, etc.)

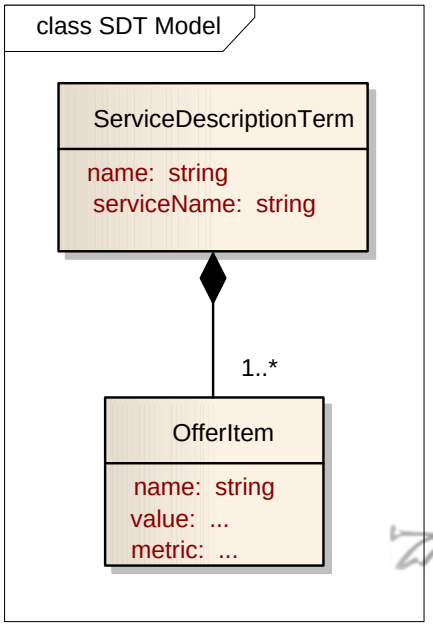
- Concrete use in ADA:

WSAG

```
<ServiceDescriptionTerm ServiceName="TranslationWS" Name="Premium">
   <OfferItem name="sourceLang" metric="metricXML:Langs">EN-UK</OfferItem>
   <OfferItem name="targetLang" metric="metricXML:Langs">ES</OfferItem>
   <OfferItem name="qualityLevel" metric="metricXML:Levels">Premium</OfferItem>
   <OfferItem name="pricePerWord" metric="metricXML:Float">0.10</OfferItem>
</ServiceDescriptionTerm>
```

WSAg4People

Service Description Terms:
Premium – TranslationWS:
sourceLang = EN-UK - **measured by** metricXML:Langs,
targetLang = ES - **measured by** metricXML:Langs,
qualityLevel = Premium - **measured by** metricXML:Levels,
pricePerWord = 0.10 - **measured by** metricXML:Float



Languages Choices in ADA

SDT Lang. | **Metrics Lang.** | Qualifying Condition Lang. | Service Level Objective Lang. | General Constraint Lang. | Context Lang. | Business Value Lang.

- To define **service properties metrics:**
  - Data type
  - Allowed values
- Concrete use in ADA:

WSAG

```
<ServiceProperties Name="TranslationProps." ServiceName="TranslationService">
   <VariableSet>
      <Variable Name="Availability" Metric="metricXML:Percentage">
         <Location>//Availability</Location>
      </Variable>
   </VariableSet>
</ServiceProperties>
```

XML

```
<met:metricXML xmlns:met="http://www.isa.us.es/ada/metrics">
   <met:Percentage type="integer" min="0" max="100" />
   <met:Binary type="integer" min="0" max="1" />
   <met:LowInteger type="integer" min="1" max="10" />
   ...
</met:metricXML>
```

WSAg4People

```
Service Properties:
   1 TranslationProps. - TranslationService
      1.1 Availability - measured by metricXML:Percentage - related to //Availability
```

Languages Choices in ADA

- A Predicate-oriented language to define expressions:

$P ::= P\ op_L\ P \mid T$	• predicate, where $op_L \in \{\wedge \mid \vee \mid \neg \mid \Rightarrow \mid \Leftrightarrow\}$
$T ::= E\ op_C\ E$	• term, where $op_C \in \{=, \neq, >, \geq, <, \leq\}$
$E ::= ID\ op_A\ ID \mid ID \mid lit$	• expression, where op_A is a right algebraic oper.

- Concrete use in ADA:

WSAG

```
<GuaranteeTerm Name="PremiumGuarantee" Obligated="ServiceProvider">
   <QualifyingCondition>
      <Predicate><![CDATA[ qualityLevel=Premium ]]></Predicate>
   </QualifyingCondition>
   <ServiceLevelObjective>
      <Predicate><![CDATA[ responseTime < 12 ]]></Predicate>
    </ServiceLevelObjective>
</GuaranteeTerm>
...
<CreationConstraints>
   <Constraint>
      <Name>CostImplication</Name>
      <Content>
         <Predicate><![CDATA[ qualityLevel=Premium ⇒ Cost > 20 ]]></Predicate>
      </Content>
   </Constraint>
</CreationConstraints>
```

WSAg4People

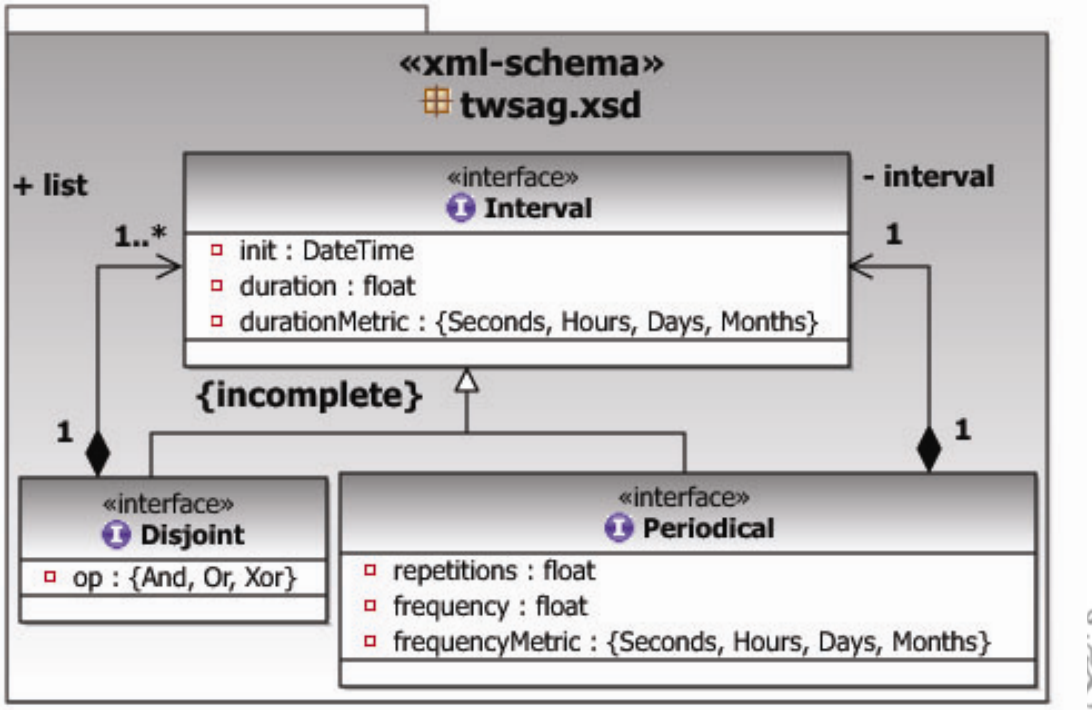
```
Guarantees:
   PremiumGuarantee by ServiceProvider
      Qualifying Condition:
         qualityLevel = Premium
      SLO:
         responseTime < 12
...
Creation Constraints:
  Constraints:
    1  CostImplication:
       QualityLevel = Premium ⇒ Cost > 20
```

Languages -not in ADA yet-

- A **Temporal language** (twsag.xsd)

  to define any kind of validity periods applied to:

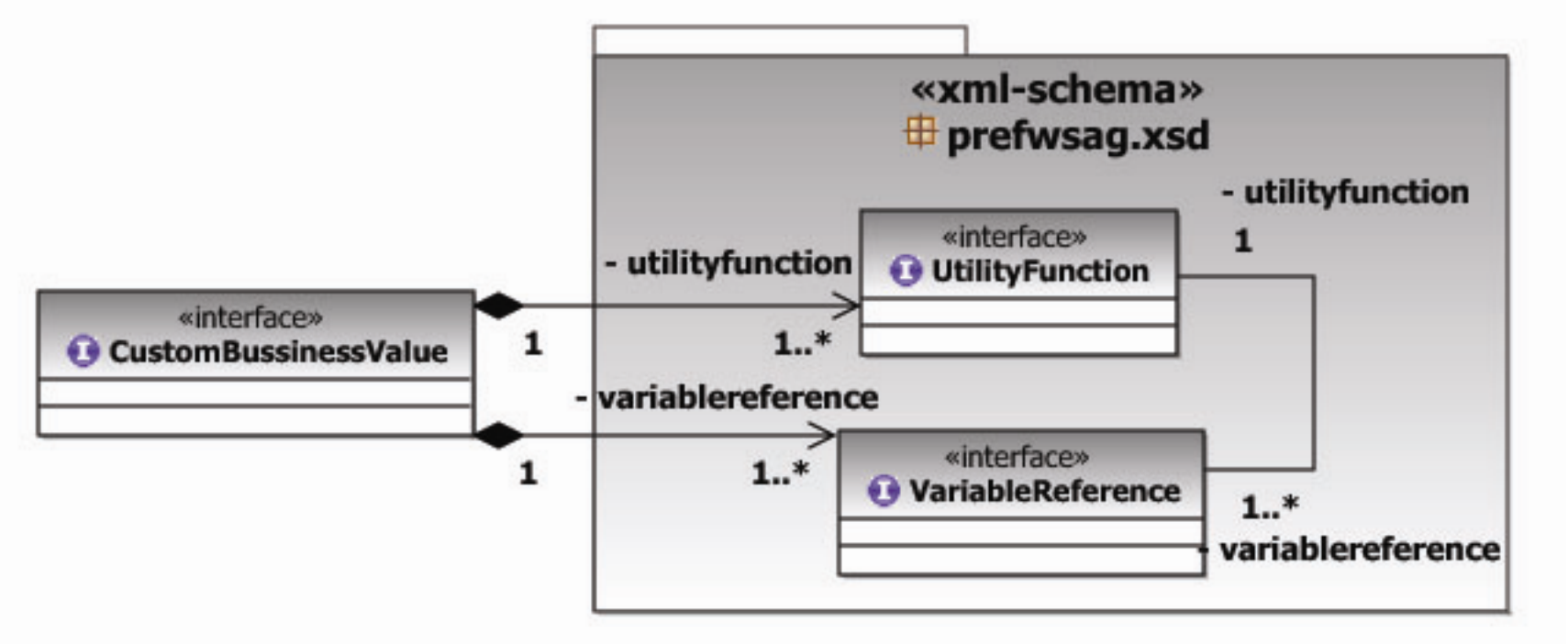
  - The whole agreement: -new Context element "**GlobalPeriod**"-
  - Concrete terms: -using "**QualifyingCondition**" -



Languages -not in ADA yet-

- An initial **Utility Function language**

  to define preferences inside BVL elements:



Our “best practices”

- **Relationship between SPs and SDTs (monitorable vs. non monitorable)**
- **Default, domain-independent KPIs and metrics**
- **Leave service properties out of compositions**
- **XML-independent model (Free the XSD in items CCs. *XML to serialize only*)**
- **To define a predicate-oriented languange for QCs-SLOs-GCs.**
- **How to fill a template?**
- **We think that it is necessary to define best practises**

Thank You!

Thank you very much!!