

Towards a NCS Ontology



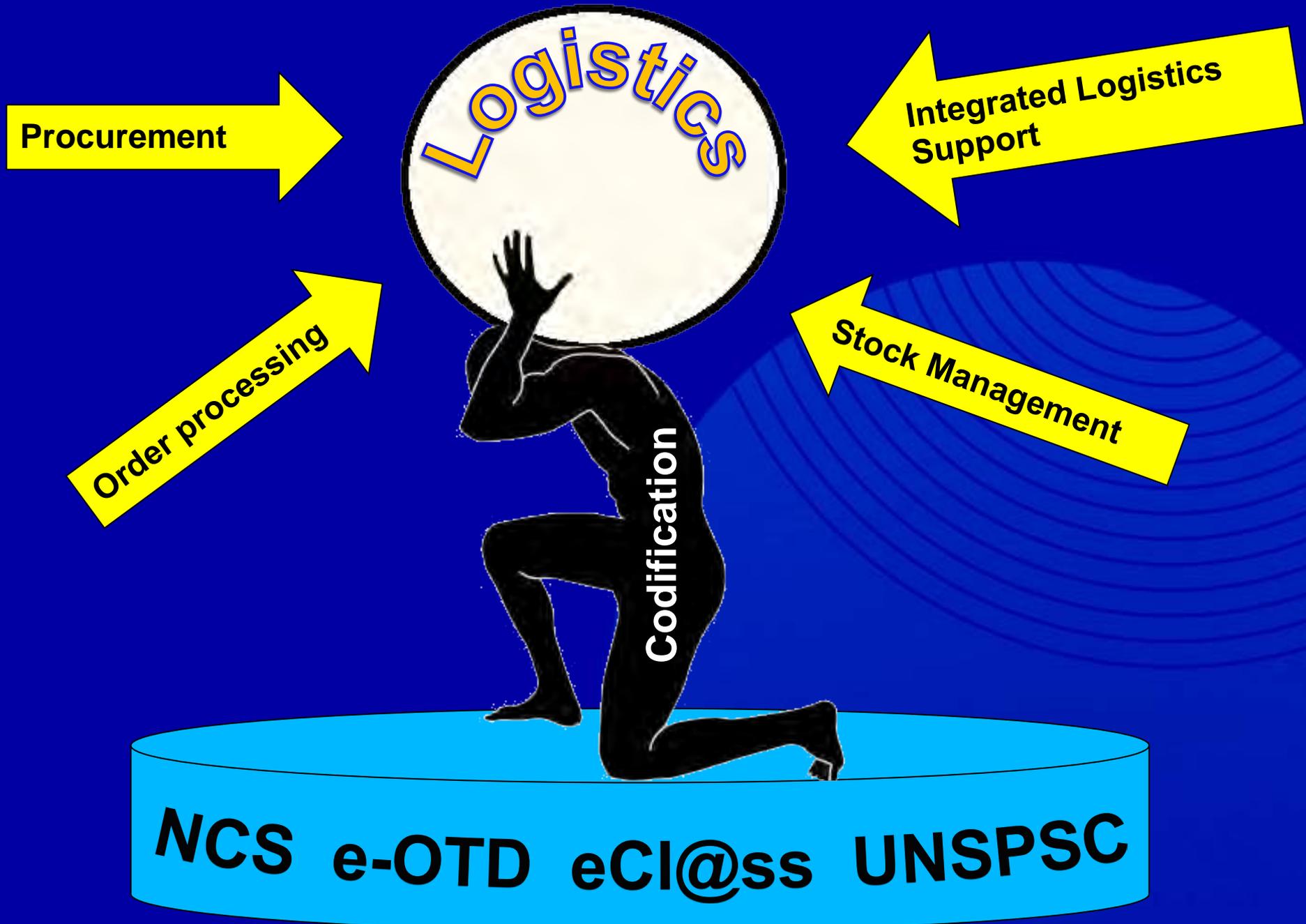
Divany Gomes Lima
divany@insilog.com.br
+ 55 21 3541-0335

"Turning logistics information into strategic asset."

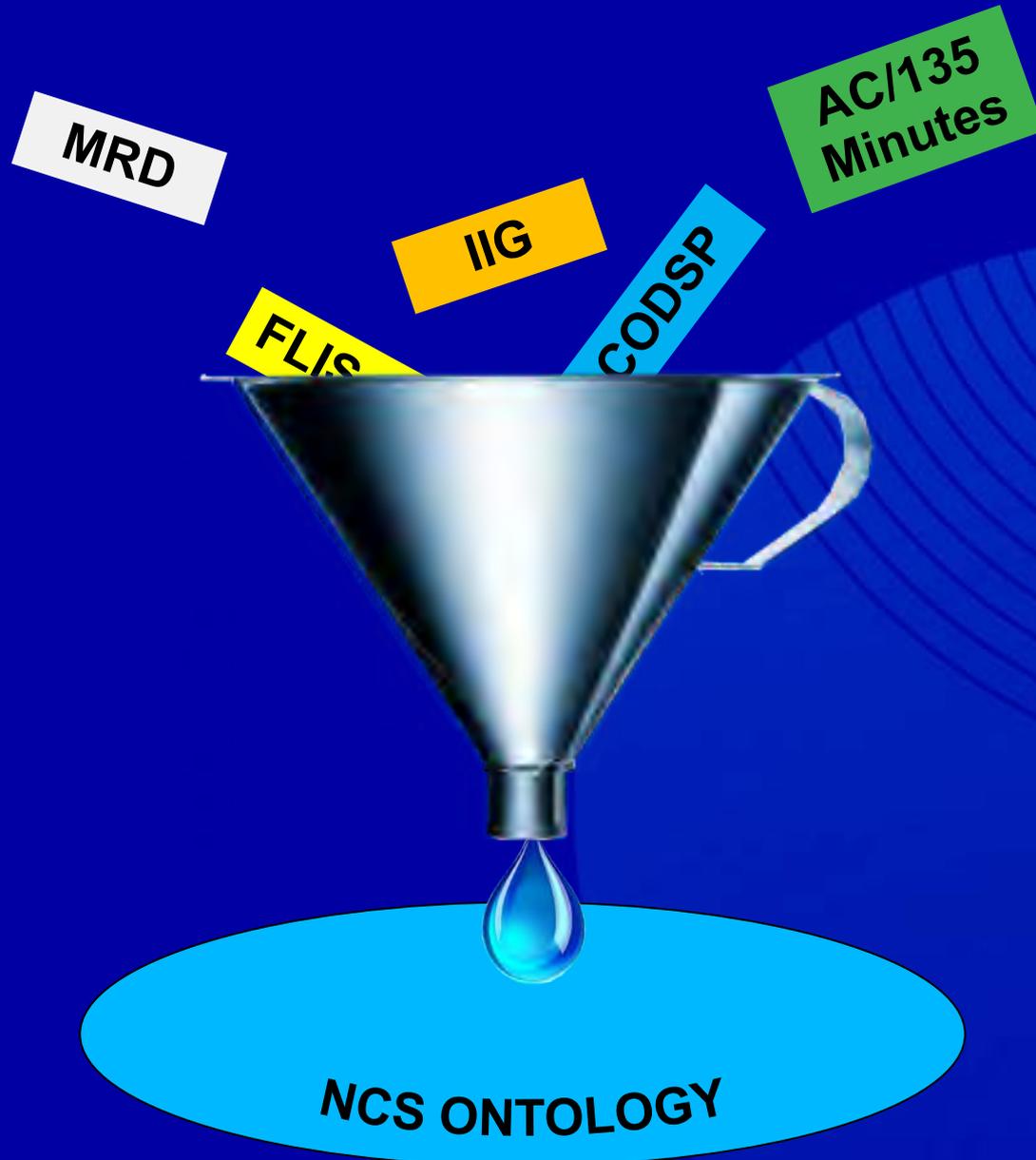
Difficulties on NCS adopting

- High costs related to:
Applications;
Codifiers teams;
Hardware and software infrastructure;
- Industry mistrust concerning codification value

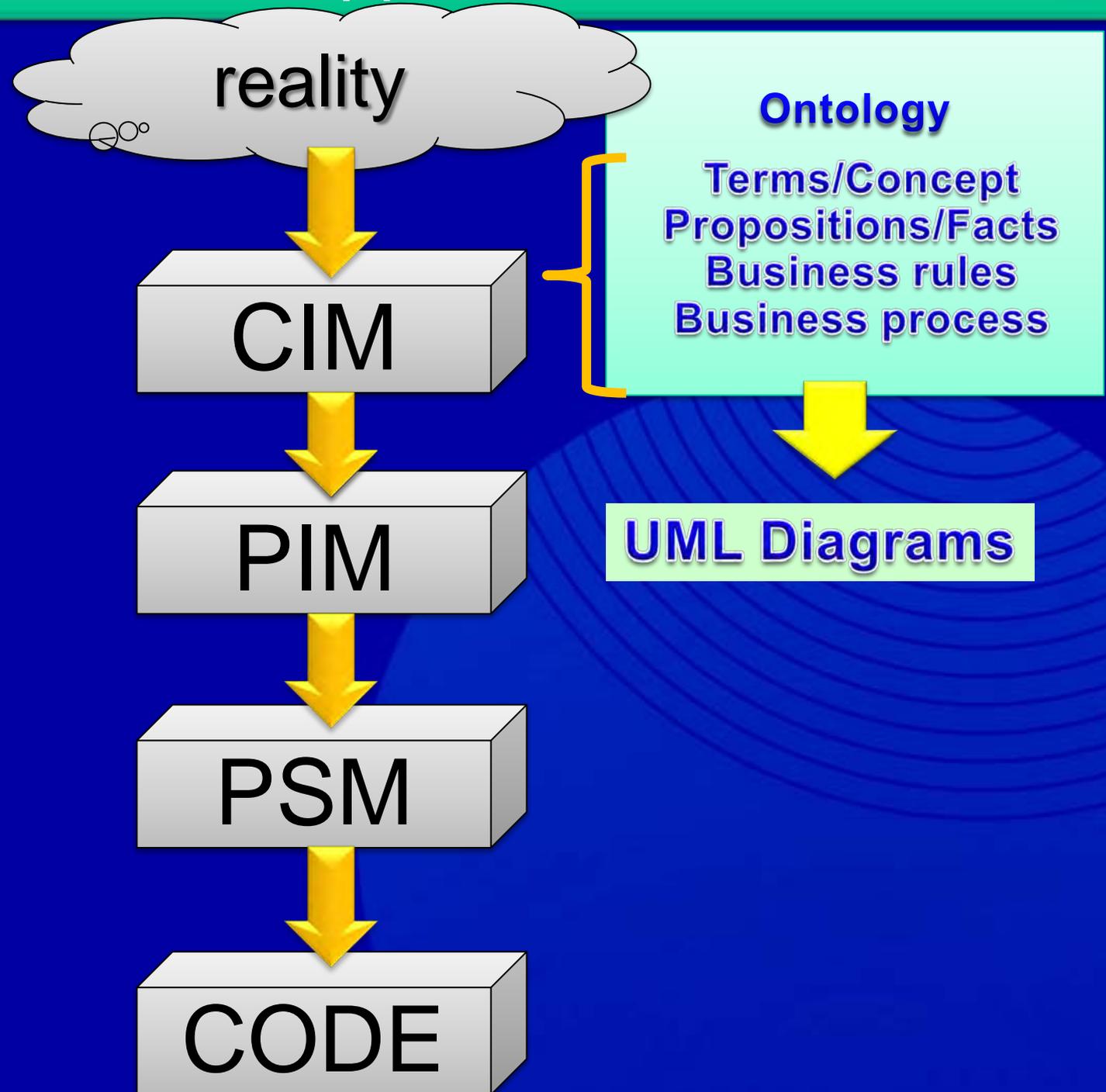
Codification Supporting Logistics



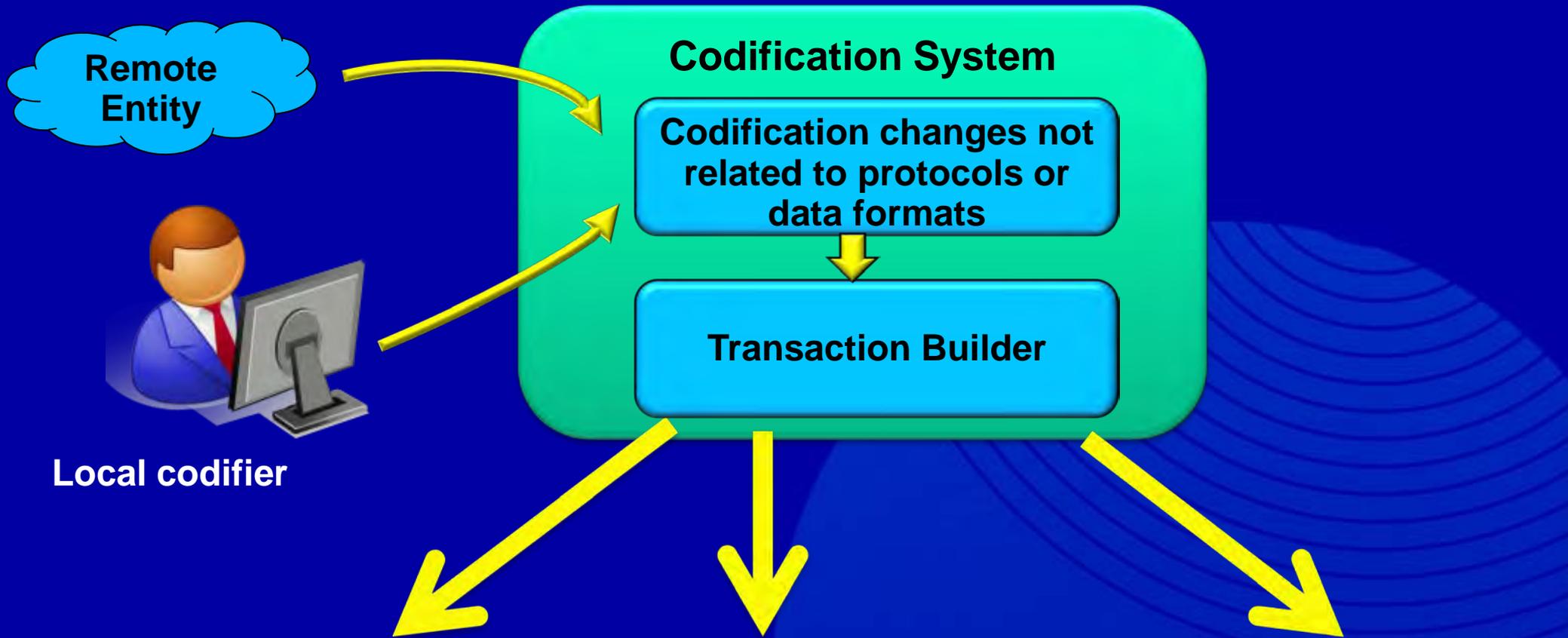
NCS Ontology



MDA Approach



Processing data, not transactions.



```
NCS Legacy Output
Ncs Message  KARR01401YA1131200001380013510191200000  LAR MB
KARR02401YA1131200001380013510191200000C 4 3 2 3 MB A 0036KALI001
KARZ03401YA1131200001380013510191200000C 4 3 2 3 MB A 8001KS234

KDRA01401YA1131200001380013510191200000  LDR MB
KDRZ02401YA1131200001380013510191200000C 0023K23EERT
```

```
Web Service Output
Soap Message  <?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2001/12/soap-envelope
encoding">
  <soap:Body>
    <ns1:sendMessage xmlns:ns1="http://MessageControl.
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
      <parameters>
        <sender>YA01</sender>
        <receiver>MBYA</receiver>
        <messageNumber>572974</messageNumber>
        <itemIdentificationCode>191200000</itemIdentificat
        <MessageDataWS>
          <type>REFERENCE</type>
          <value>0036K - ALI001</value>
```

```
EOTD Output
Eotd Message  <?xml version="1.0" encoding="UTF-8"?>
<cat:catalogue xmlns:val="urn:x-eotd:xml-schema:value" xmlns:cat="u
  <cat:content>
    <cat:item class-ref="0161-1#01-1200000#1">
      <cat:reference reference-number="123ed" org
      <cat:reference reference-number="ALI001" or
      <cat:reference reference-number="S234" org
    </cat:item>
  </cat:content>
</cat:catalogue>
```

Software presentation

Report Changes for Item Version	
Changes	NEW VERSION
	NAME_CODE (UNCHANGED) : 0100
	CLASS_CODE (UNCHANGED) : 3510
	NCB_CODE (UNCHANGED) : 19
	NON_SIGNIFICANT_NUMBER (UNCHANGED) : 1200000
	REFERENCE (UNCHANGED) : 9000k - 123ed
	REFERENCE (ADDED) : 0036K - ALI001
	REFERENCE (ADDED) : 8001K - S234
	REFERENCE (DELETED) : 0023K - 23EERT

NCS Legacy Output

```
Ncs Message KARA01401YA1131200001380013510191200000 LAR MB
KARA02401YA1131200001380013510191200000C 4 3 2 3 MB A 0036KALI001
```

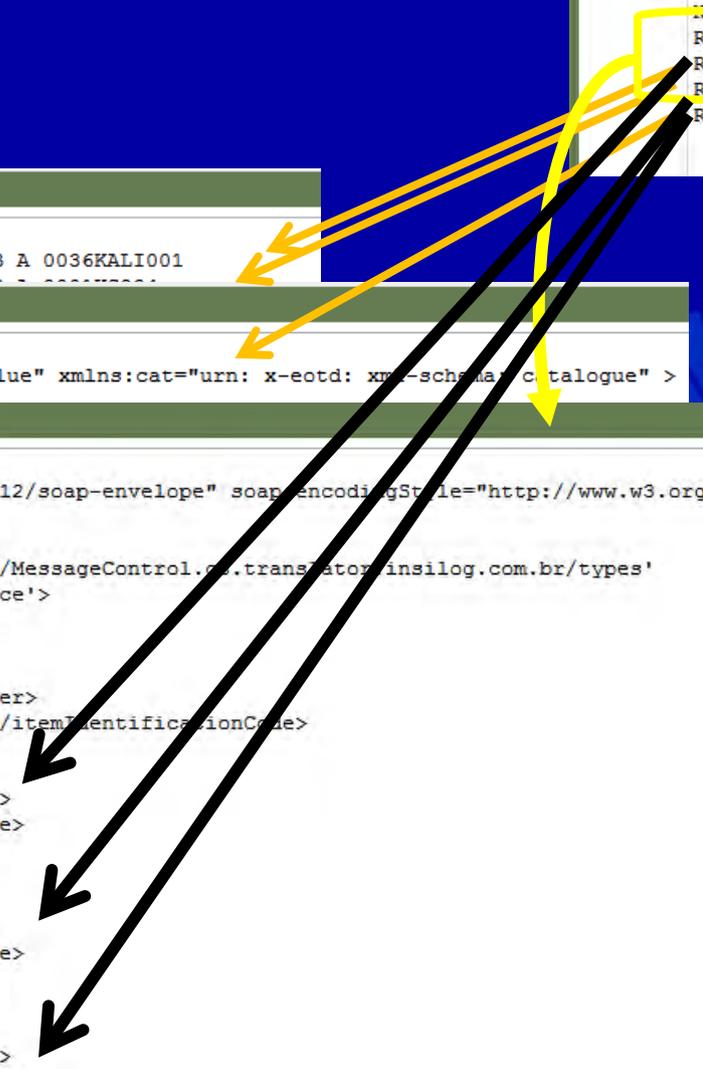
EOTD Output

```
Eotd Message <?xml version="1.0" encoding="UTF-8"?>
<cat:catalogue xmlns:val="urn:x-eotd:xml-schema:value" xmlns:cat="urn:x-eotd:xml-schema:catalogue" >
```

Web Service Output

```
Soap Message <?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2001/12/soap-envelope" soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">
  <soap:Body>
    <ns1:sendMessage xmlns:ns1='http://MessageControl.cs.translator.insilog.com.br/types'
xmlns:xsi='http://www.w3.org/2001/XMLSchema-instance'>
      <parameters>
        <sender>YA01</sender>
        <receiver>MBYA</receiver>
        <messageNumber>572974</messageNumber>
        <itemIdentificationCode>191200000</itemIdentificationCode>
        <MessageDataWS>
          <type>REFERENCE</type>
          <value>0036K - ALI001</value>
          <changeType>ADDED</changeType>
        </MessageDataWS>
        <MessageDataWS>
          <type>REFERENCE</type>
          <value>8001K - S234</value>
          <changeType>ADDED</changeType>
        </MessageDataWS>
        <MessageDataWS>
          <type>REFERENCE</type>
          <value>0023K - 23EERT</value>
          <changeType>DELETED</changeType>
        </MessageDataWS>
      </parameters>
    </soap:Body>
  </soap:Envelope>
```

» Ok



“Turning logistics information into strategic asset.”

INSILOG

Avenida Rio Branco, 26 – Sobreloja, grupo 86
Centro – Rio de Janeiro – RJ
20090-001 - Brazil
+ 55 21 3541-0335
comercial@insilog.com.br
www.insilog.com.br

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Towards a NCS Ontology

Divany Gomes Lima
divany@insilog.com.br

New countries joining NATO Codification System (NCS) face the following problems:

- high costs for developing and maintaining applications;
- high costs to establish codifiers teams;
- high costs of hardware and software infrastructure to support codification process;
- industry is not confident that sharing data will help its business

We have seen NCS worried about performance indicators which address data quality. We are following the efforts to mapping or connect many product identification/classification patterns within NCS process. These tasks are undoubtedly relevant. But we are losing the point here.

In the real life codification has to serve logistics. Processes as procurement, stock management, order processing and integrated logistics support need to be supported by a codification system. In the real life industry still tries impose its own codification system when furnishing the data required by the consumer. The absence of a widely accepted data exchange pattern contributes to this behavior. As result, for complex systems, Codification Clauses are not easy to issue and put in practice.

So we have to rethink the way we manage the codification process and data interchange. We need a new mindset. Currently knowledge concerning NCS is dispersed in tens of thousands of pages from different sources as ACodp-1, FLIS Manual, MRD, CODSP, IIG, NMBS and minutes of AC/135.

In order to tackle the costs problem, knowledge must be easily available for codifiers and developers. A new approach to software development needs to be adopted. We need to take advantage of modern techniques to make the tools available to countries and organizations with distinct logistical and technological maturity levels. We should pay attention to Cloud computing, Web Services, XML and Semantic Web when designing new solutions.

In the 21st Century we are facing a growing of multinational projects. More companies from different emergent countries which don't have NCS tradition are acting globally. These countries became new players of international industry. We need to show the business advantage on adopt the NCS standard, not only by powerpoint presentations, but with indicators which can prove this point of view unequivocally.

INSILOG have been working close to Brazilian industry to find an alternative for these constraints. We understand that make NCS knowledge available in a easy and costless way could contribute to

achieve better and cheaper tools.

We propose to document the NCS knowledge as a Domain Ontology. This approach was used to develop the Brazilian codification tool. INSILOG has extended and deepened this concept not only to develop codification tools but to connect them to logistics systems and e-business applications.

Instead of mapping data formats or protocols, we are concerned to ontology mapping. If we agree to use the same ontology in different systems then data interchange will be a minor problem. We propose something like the effort that have been done between NCS and e-otd but not restricted to product identification. To demonstrate how it could be work we built a quick and dirty application that cost us 8 hours of development.

Currently, the exchange of information within the NCS is performed with data formats, business rules and rules of communication packed together. We approach these three areas separately. The data were organized into a taxonomy adherent to the NCS and its relations were documented as an ontology for material identification and classification. The application was modeled from an ontology and built using the MDA approach. The MDA approach makes the development and maintenance of applications easier. The representation of the identification and classification as ontology allows to establish a more consistent mapping among the various existing systems, regardless of the technology applied. The separated handling of cataloging rules, data and communication protocols makes data exchange more flexible. In fact we can process only data instead of transactions as usual in NCS.

Additionally the codification at source concept could be applied even when e-otd tools are not available.