Oracle Policy Automation and Business Rules

NZOUG presentation
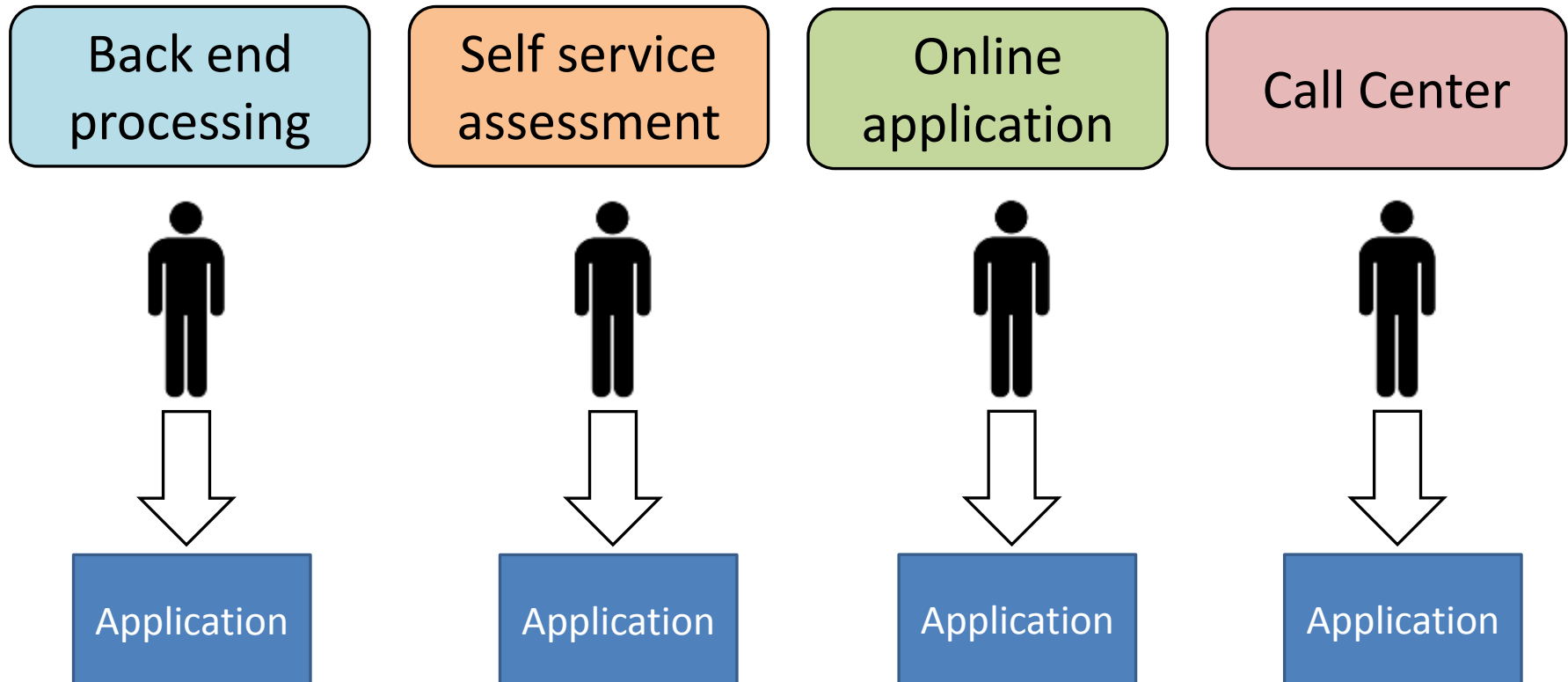
By Michael Crowley

Agenda

- Why you should automate business rules

- Why you should use OPA

- Who uses OPA

- What goes on inside OPA

- Questions

The Challenge

Why you should automate business rules

Asparona
CONSULT DELIVER SUPPORT

Current State:
Multiple Channels / Multiple Applications

Back end processing	Self service assessment	Online application	Call Center

Application	Application	Application	Application

What are Business Rules?

"Business rules define, constrain, assert, influence, enable or control some aspect of the behaviour of the business"

If the applicants family has a history of heart disease, **then** the premium is increased 50%

If the customer has been bankrupt, **then** the customer cannot access additional borrowing

The Passage of Time...

Reprint as at 1 January 2013

Land Transport Act 1998

Public Act   1998 No 110
Date of assent   8 December 1998
Commencement   see section 1(2), (3), (5)

Note
Changes authorised by section 17C of the Acts and Regulations Publication Act 1989 have been made in this reprint.
A general outline of these changes is set out in the notes at the end of this reprint, together with other explanatory material about this reprint.
This Act is administered by the Ministry of Transport.

Contents

Threshing Committee of the U. S. Food Administr'n for Knox Co.

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NZOUG   Inspiring. Practical. Informative.
2013   Te Papa, Wellington
New Zealand, 18 to 19 March   2013

The Traditional Software Life Cycle

STEP 1:

Document requirements, including business rules
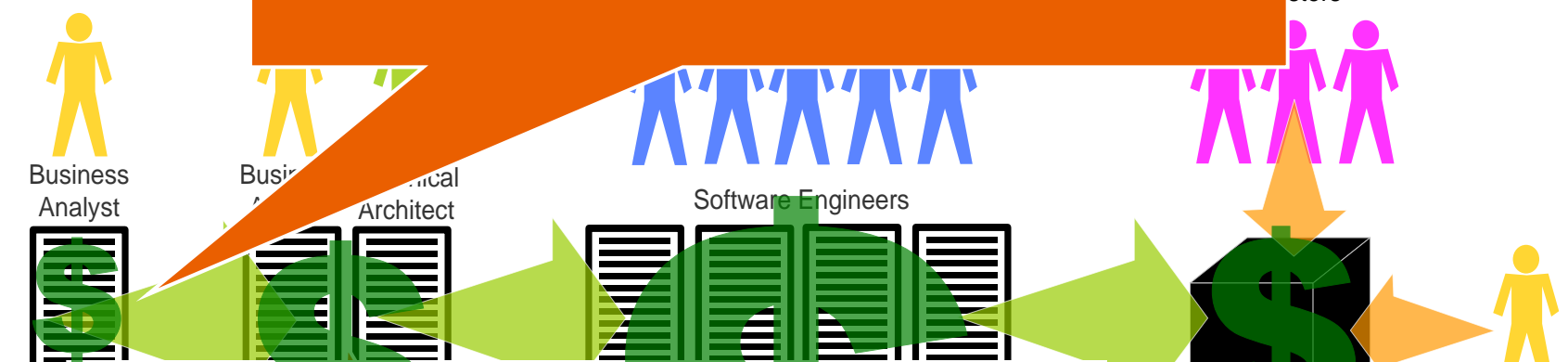
STEP 4:

Test executables – note this is depicted as a black box because of the lack of transparency into system decisions

STEP 3:

Build solution using source code & supporting libraries

Driving change from this point in the process is very expensive – it involves traversing the entire life cycle again!
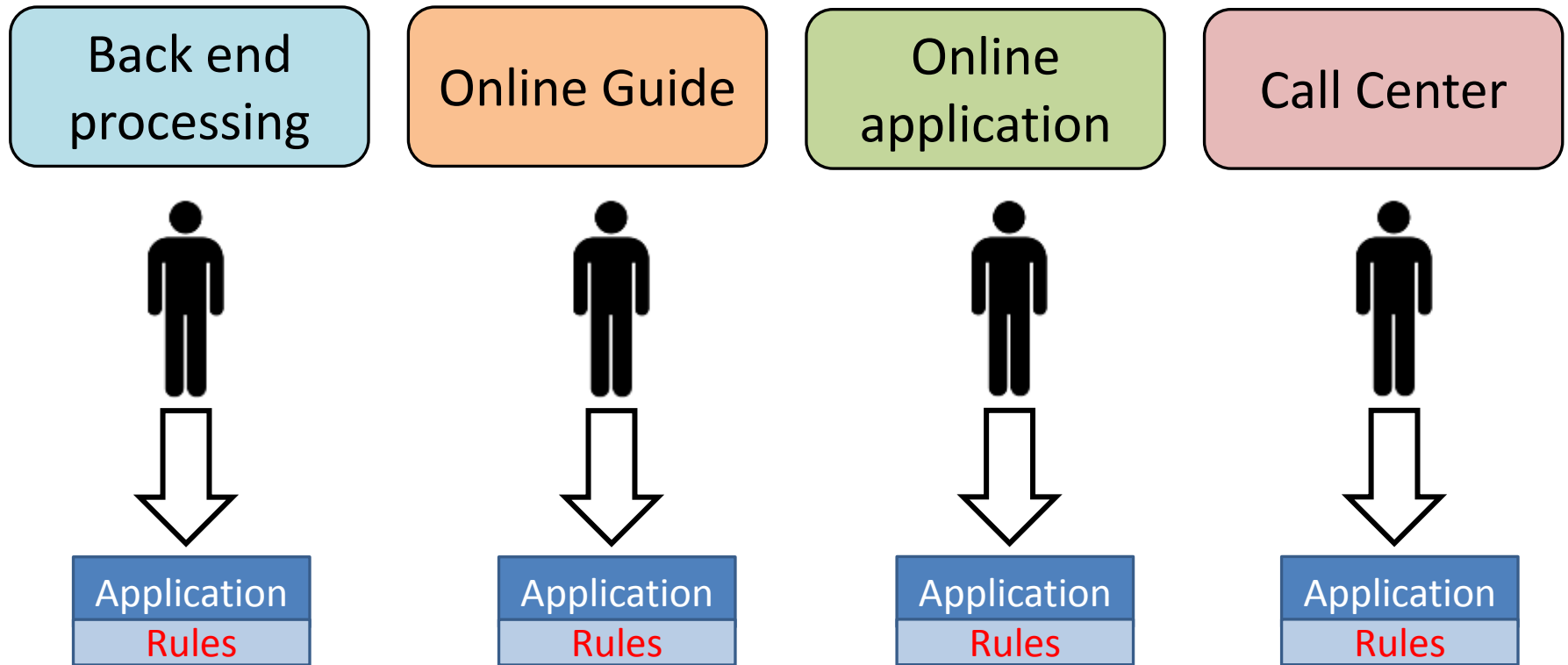
Business Analyst

Technical Architect

Software Engineers

Executable Program

Business Analyst

Requirements Specification

Source Code & Libraries

What do we Have?

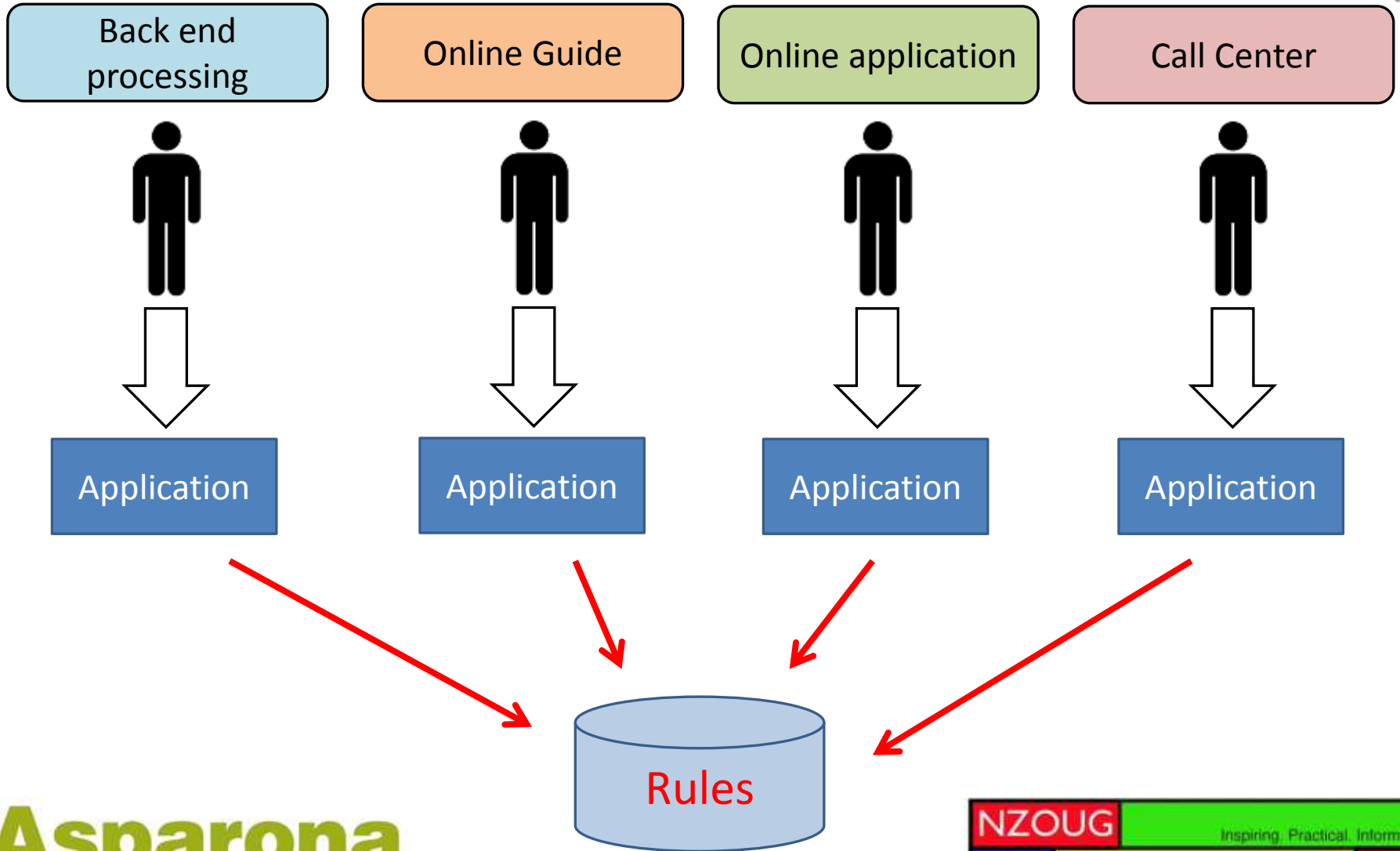| The Challenge… |
|---|
| Logic embedded in many systems / applications |
| Achieving consistency across channels is difficult |
| Maintenance of rules in multiple systems is expensive and time consuming |
| High dependency on IT (technical resources) |

Asparona
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2013
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2013

Multiple Channels / Multiple Applications

Back end processing	Online Guide	Online application	Call Center

Application	Application	Application	Application
Rules	Rules	Rules	Rules

Extracting Business Rules

Back end processing	Online Guide	Online application	Call Center

Application Application Application Application

Rules

What do we Need?

The Need…
Externalise business logic
Re-use single source of rules across multiple system
Streamlined changes in rule logic
Enable business users ownership of business rules
Faster and lower costs

Oracle Policy Automation

Rule Development

Compile and Test

Deployment and Integration
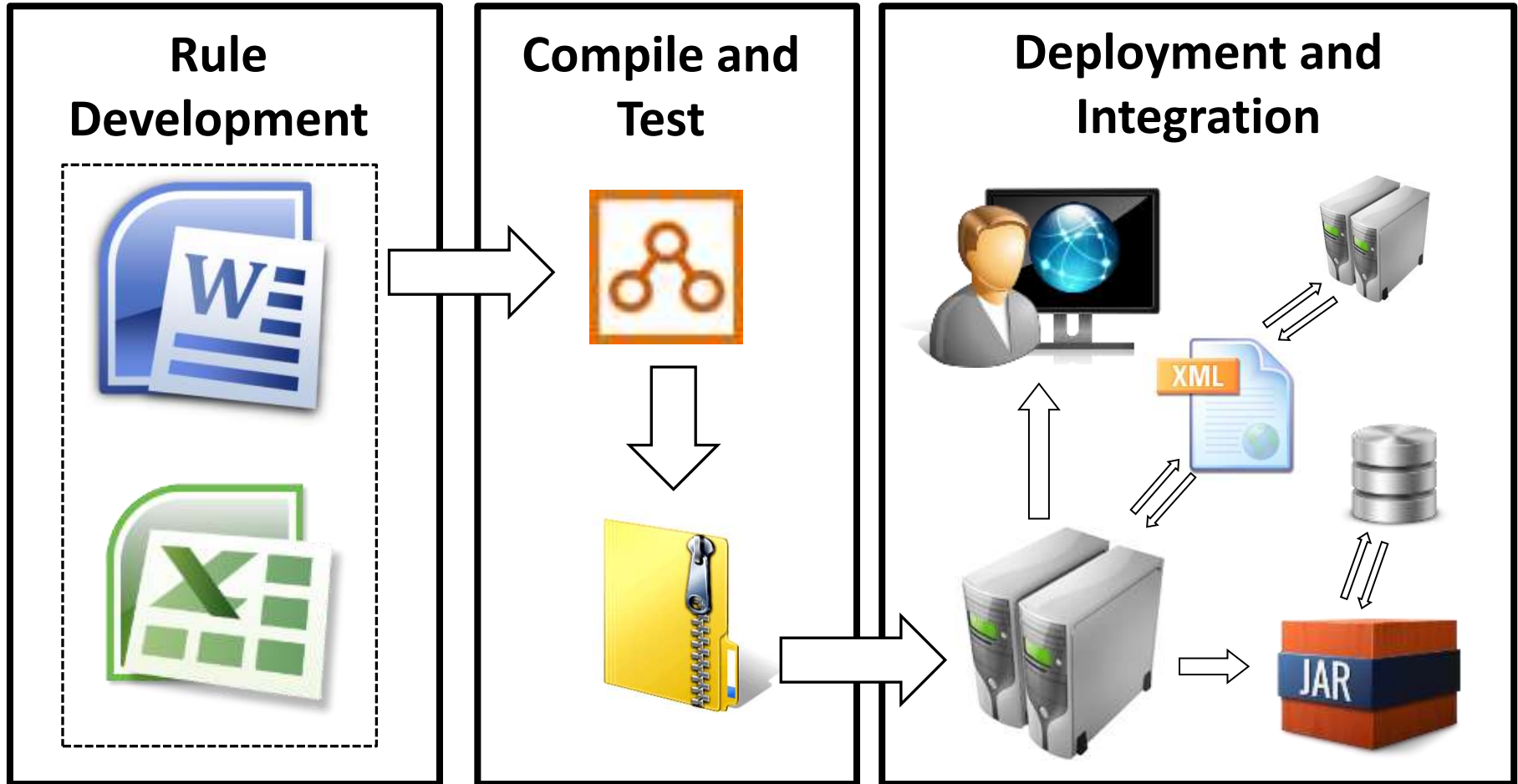
The Oracle Policy Automation Life Cycle

STEP 1:

Capture rules in Oracle Policy Modeling

STEP 3:

Deploy & test rules – well supported by transparent execution (decision reports)

Analyst

Analyst

Business Rules

Enterprise Data Model

Executable Rules

Business Analyst
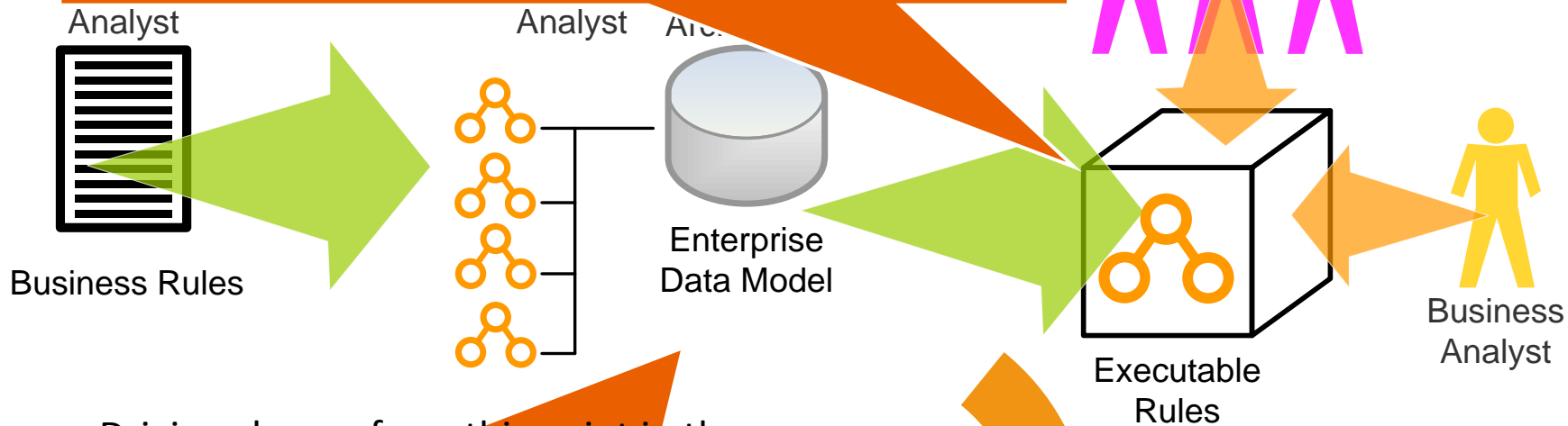
Driving change from this point in the process is much cheaper – it involves fewer resources & fewer stages

STEP 2:

Map rules to enterprise data model

Oracle Policy Automation:

Data → Rules → Determination
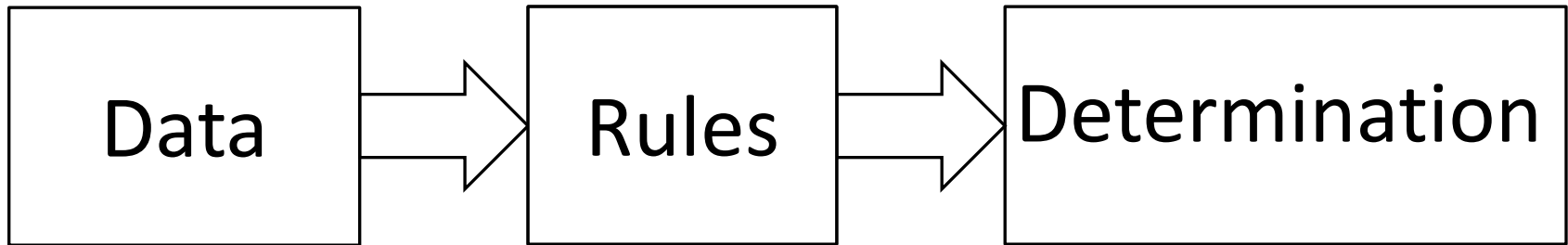
Structured data:
- True/false
- Currency
- Numbers
- Text
- Dates
- Time

Business Rules:
- Legislation
- Contracts
- Policy
- Practice

Determinations:
- *"The person is eligible…"*

- *"The amount the person is eligible for…"*

Who currently uses OPA?

In New Zealand, Inland Revenue:

http://www.ird.govt.nz/calculators/keyword/depreciation/calculator-depreciation.html

Some users internationally:

- **Tax Agencies**
  - HMRC, IRS
- **Social Security**
  - Govt of British Columbia, Dept of Social Security (Sweden), 50+ Local Councils in the UK
- **Defence**
  - Ministry of Defence (UK), Dept of Defence (Australia), Dept of Veterans Affairs (Australia)
- **Other**
  - Dept of Immigration (Aus), Montana DMV, Dept Trade and Industry (UK), Dept of Statistics (Netherlands), Credit Suisse, UBS, Toyota Motor Corp (USA), AT&T, American International Assurance

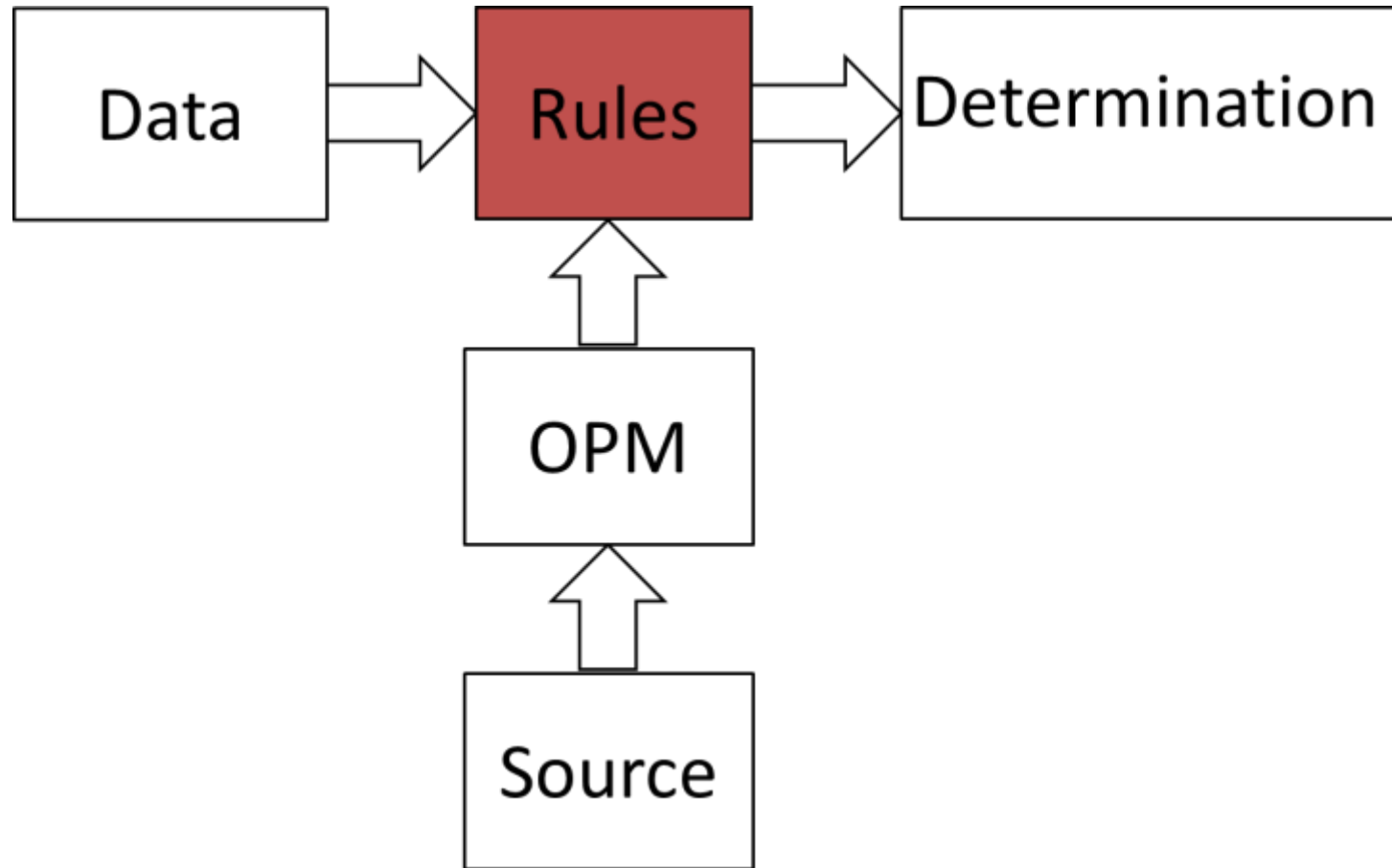# *Australian Dept. Immigration and Citizenship*

Who is OPA Suitable For?

Are You Asking:

- Is the person eligible for, entitled to, liable for, required to…?

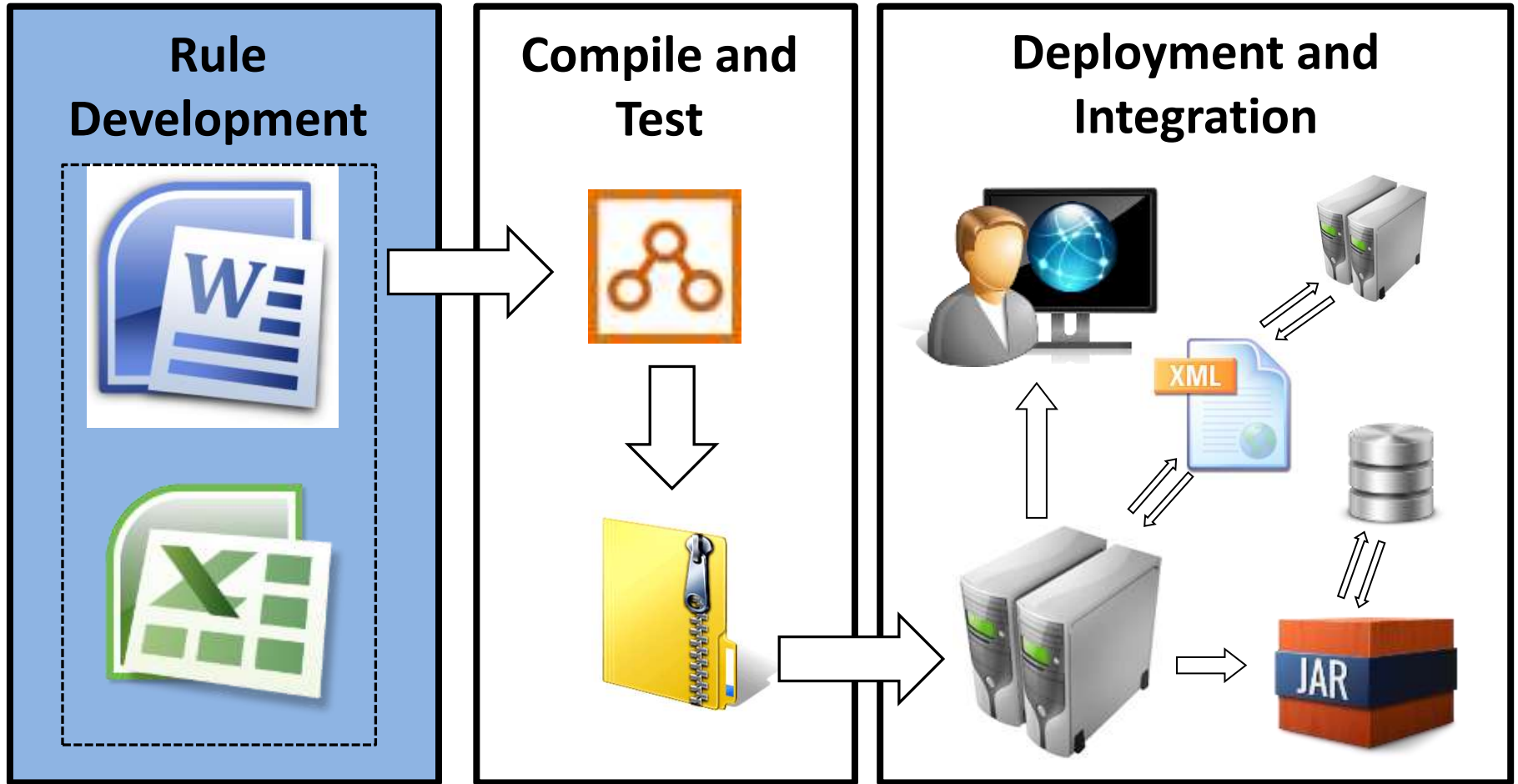- What is the amount of benefit, compensation, tax, payment…?
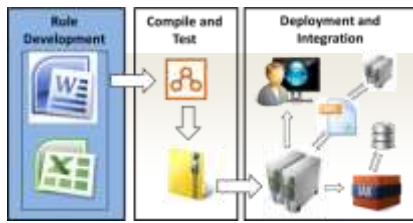
Yes?... Then OPA is right for you!

What goes on inside OPA?

Oracle Policy Automation:

Components

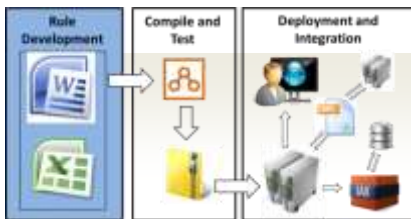| Rule Development	Compile and Test	Deployment and Integration

Rules Development

Rule Development

- Rules written in Word
  - Isomorphic
  - Plain language
  - Easy rule changes

- Rules written in Excel
  - Suitable for tables of rates
  - Often suitable for schedules in legislation

Isomorphism between source material the rules written in Word

89 Unemployment benefit: standard eligibility requirements

(1) A person is entitled to an unemployment benefit if he or she satisfies the criteria in subsections (2), (3), and (4), and—

    (a) is not in full-time employment, but—

        (i) is seeking it; and

        (ii) is available for it; and

        (iii) is willing and able to undertake it; and

        (iv) has taken reasonable steps to find it; or

    (b)[Repealed]

    (c)[Repealed]

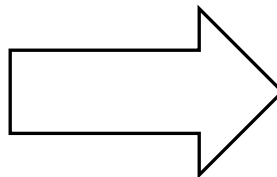(2) An applicant for an unemployment benefit—

    (a) must be aged at least 18 years, in the case of an applicant without a dependent child:

    (b) must be aged at least 19 years, in any other case.

(3) An applicant for an unemployment benefit must meet the residential requirements in section 74AA.

(4) An applicant for an unemployment benefit must have—

    (a) no income; or

[b2] 89(1)   [b1] the person is entitled to an unemployment benefit if

[b4] (a)   [not b3] the person is not in full-time employment
and
all

    [b6] (i)   [b5] the person is seeking full-time employment
    and
    [b8] (ii)   [b7] the person is available for full-time employment
    and
    [b10] (iii)   [b9] the person is willing and able to undertake full-time employment
    and
    [b12] (iv)   [b11] the person has taken reasonable steps to find full-time employment

and
[b13] (2) either

    [b14] (a) both
        [b15] the person is aged at least 18 years
        and
        [not b16] the person does not have a dependent child
    or
    [b17] (b) both
        [b18] the person is aged 19 years or greater
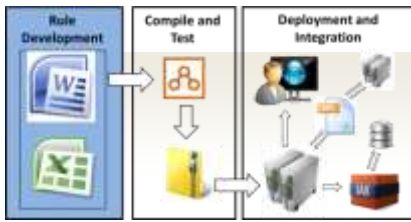   and
        [b16] the person has a dependent child

and
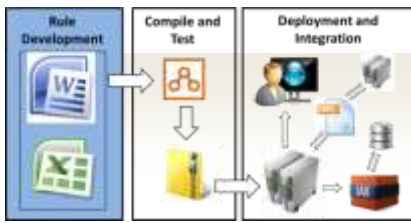[b20] (3) [b19] the person meets the residential requirements Social Security Act 1964, s 74AA
and
[b21] (4) either
   [b23] (a)   [b22] the person must have no income

Rules in Excel

the customers age	the customer is a smoker	the weekly amount of the premium
	TRUE	$5.77
18	FALSE	$11.54
	TRUE	$5.96
19	FALSE	$11.92
	TRUE	$6.15
20	FALSE	$12.31
	TRUE	$6.35
21	FALSE	$12.69
	TRUE	$6.54
22	FALSE	$13.08
	TRUE	$6.73
23	FALSE	$13.46
	TRUE	$6.92
24	FALSE	$13.85
	TRUE	$7.12
25	FALSE	$14.23
	TRUE	$7.31
26	FALSE	$14.62
	TRUE	$7.50
27	FALSE	$15.00
	TRUE	$7.69
28	FALSE	$15.38
	TRUE	$7.88
	FALSE	$15.77

Time Based Reasoning

	2012-11-13	2012-11-15	2012-12-13	2012-12-14	2013-01-10	2013-01-17	2013-01-19	2013-02-07
Global								
Global								
The person's loan account balance is {$4,5(	4564.0		2476.0	5745.0	6876.0	3868.0		6546.0
The person's net position is credit.({true, fa	True				False	True		False
The person's savings account balance is {$	5469.0	6876.0	6543.0		8765	6577.0		6543.0
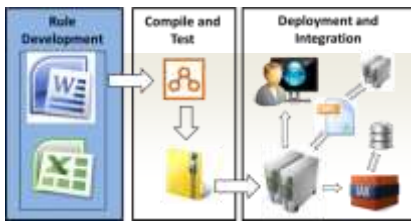
Complexity in Data Models
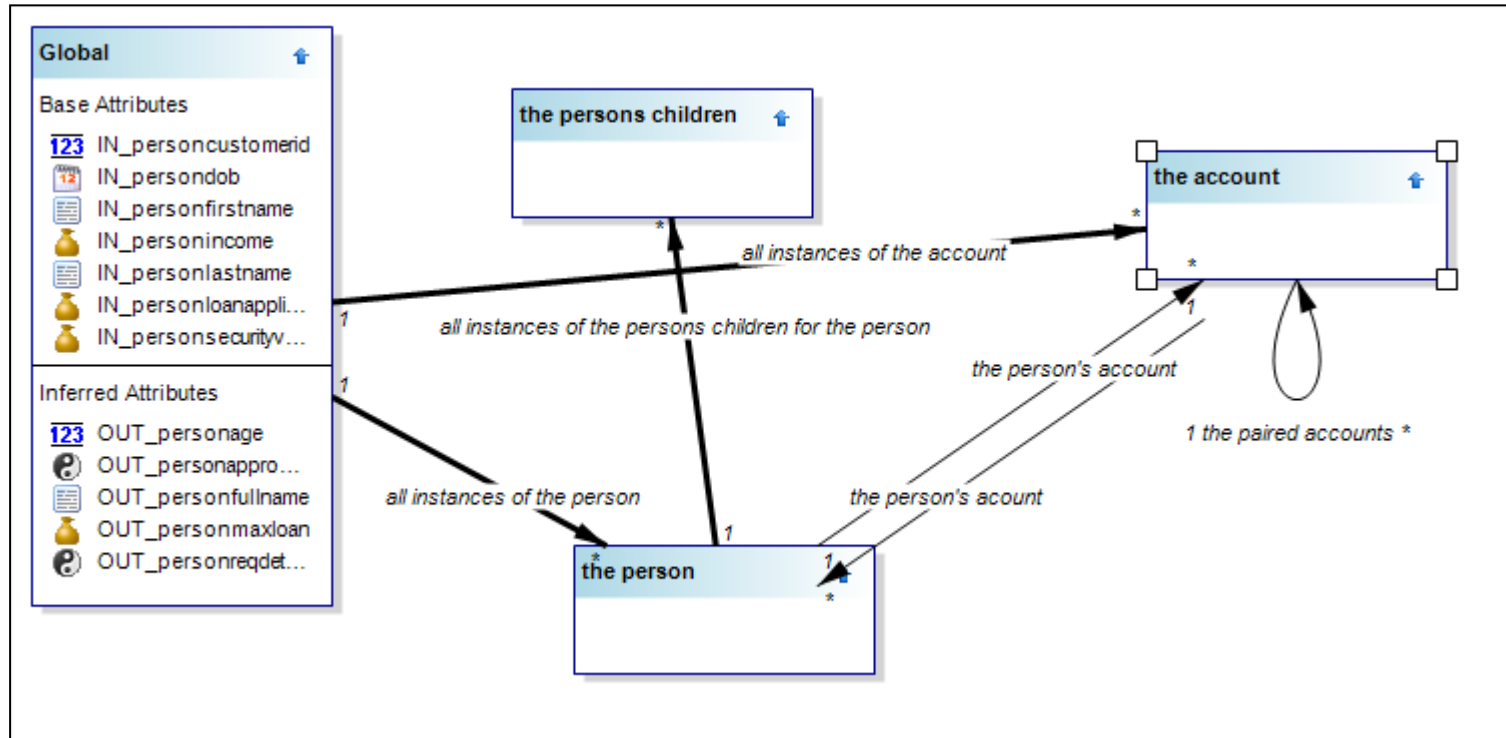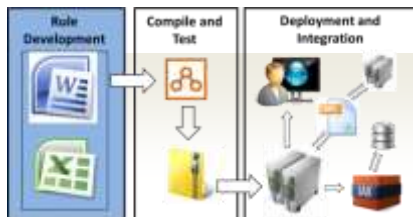
[p1] the weekly amount of the major disaster grant under the Major Disaster Grant Act 1990, s 75	
[100] $100	[p2 < #1995-04-01] the date of the assessment < 1995-04-01
[110.50] $110.50	[p2 >= #1995-04-01] the date of the assessment >= 1995-04-01 and [p2 < #1999-04-01] the date of the assessment < 1999-04-01
[122.80] $122.80	[p2 >= #1999-04-01] the date of the assessment >= 1999-04-01 and [p2 < #2005-04-01] the date of the assessment < 2005-04-01
[135.98] $135.98	[p2 >= #2005-04-01] the date of the assessment >= 2005-04-01
[uncertain] uncertain	otherwise

Compile and Test

Rule Development

Compile and Test

Deployment and Integration
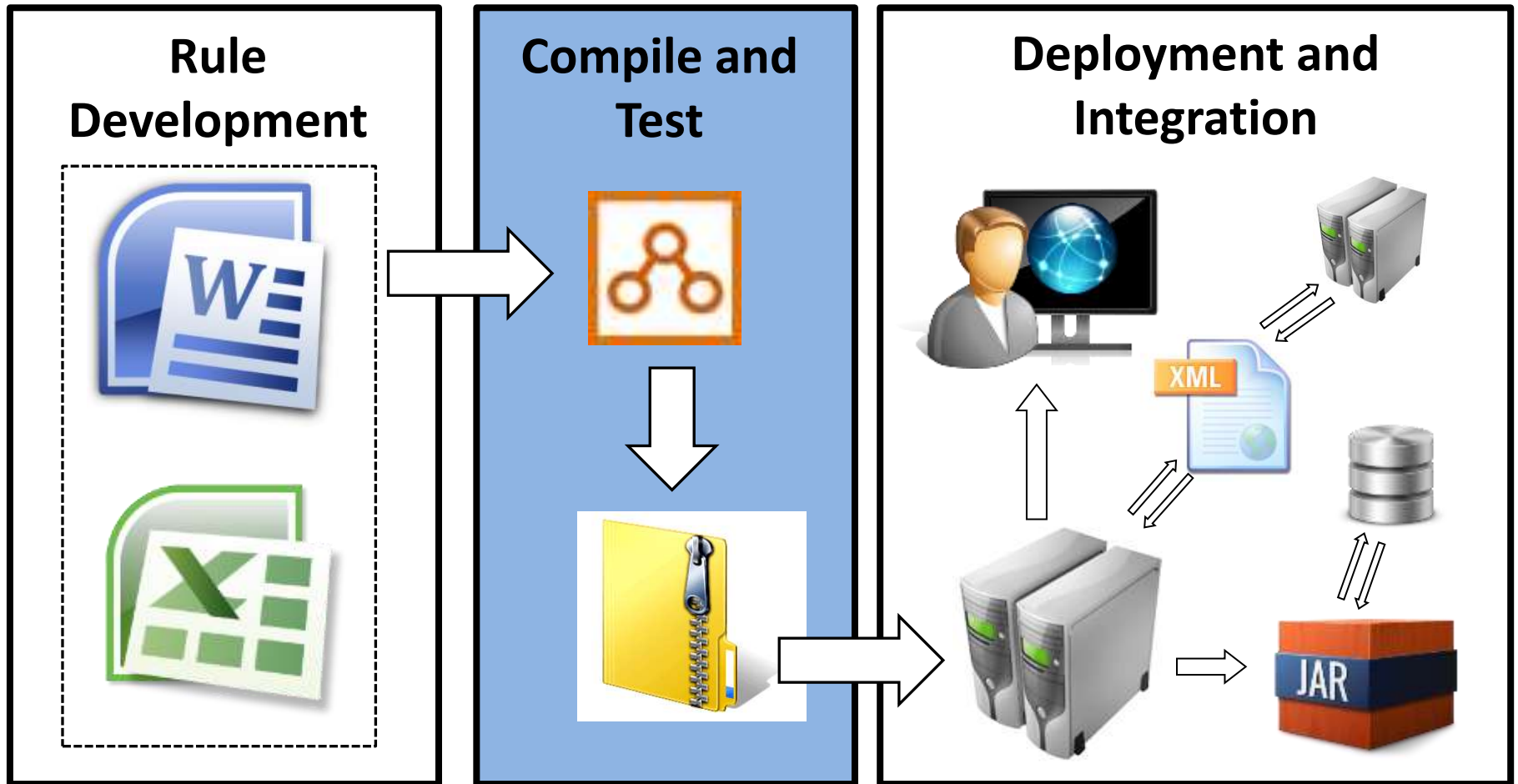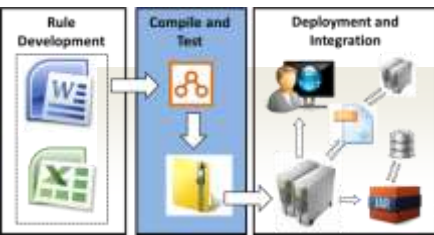
Compile and Test

Compile, Build and Test
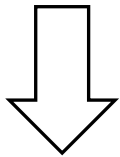
- Compile

- Debugging

- Testing

- Test script coverage

- Rule visualisation

Debugging

Constructing a Test Script

Name	Value	Text
Base Attributes:		
IN_personfirstname	<Unknown>	The person's first name is unknown.
IN_personlastname	<Unknown>	The person's last name is unknown.
IN_persondob	<Unknown>	The person's date of birth is unknown.
IN_personincome	<Unknown>	The person's annual income is unknown.
IN_personloanapplicationamount	<Unknown>	The amount of the personal loan the person has applied for is unknown.
IN_personsecurityvalue	<Unknown>	The value of the security the person has provided is unknown.
IN_personcustomerid	<Unknown>	The person's customer ID number is unknown.
Inferrable Attributes:		
OUT_personapproved	<Unknown> [<Iq...	Is the person approved for the loan?
OUT_personreqdetails	<Unknown>	Has the person provided the required details?
OUT_personfullname	<Unknown>	The person's full name is unknown.
OUT_personage	<Unknown>	The person's age is unknown.
OUT_personmaxloan	<Unknown> [<Iq...	The maximum amount the person can borrow is unknown.

Show All   Search

Temporal Options...   Import   Export

Execute

Notes

Testing and Test Scripts
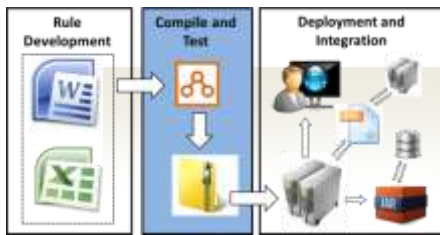
Regression Tester Report

Generated 30/01/2013 2:51 p.m.

Summary

Test cases		Attributes	
Number of test cases:	4	**Number of outcomes:**	4 (**4** significant)
Test cases passed:	3 (75%)	**Matching outcomes:**	**3** (75% of total). Of these, **3** (100 % of matching) matched exactly and **0** (0 % of matching) matched after allowance for defined thresholds.
Test cases failed:	1 (25%)	**Different outcomes:**	1 (25%)
Test cases ignored:	0 (0%)	**Ignored outcomes:**	0 (0%)
Test cases with errors:	0 (0%)		

Test case comparison results

Cases	Entities	Outcomes	Expected	Actual
Test 1 Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	p19@Rules_DemoRules_doc	240.0	240.0
Test 2 Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	p19@Rules_DemoRules_doc	150.0	150.0
Test 3 Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	p19@Rules_DemoRules_doc	40.0	40.0
Test 4 Fail (1 out of 1 items)	global[global 1]	p19@Rules_DemoRules_doc	**150.0**	**145.0**

Test Script Coverage Report

Data Visualisation

- Provides an overview
- Visual verification of dependencies
- Supports demos, training and sign off

Components

Rule Development	Compile and Test	Deployment and Integration
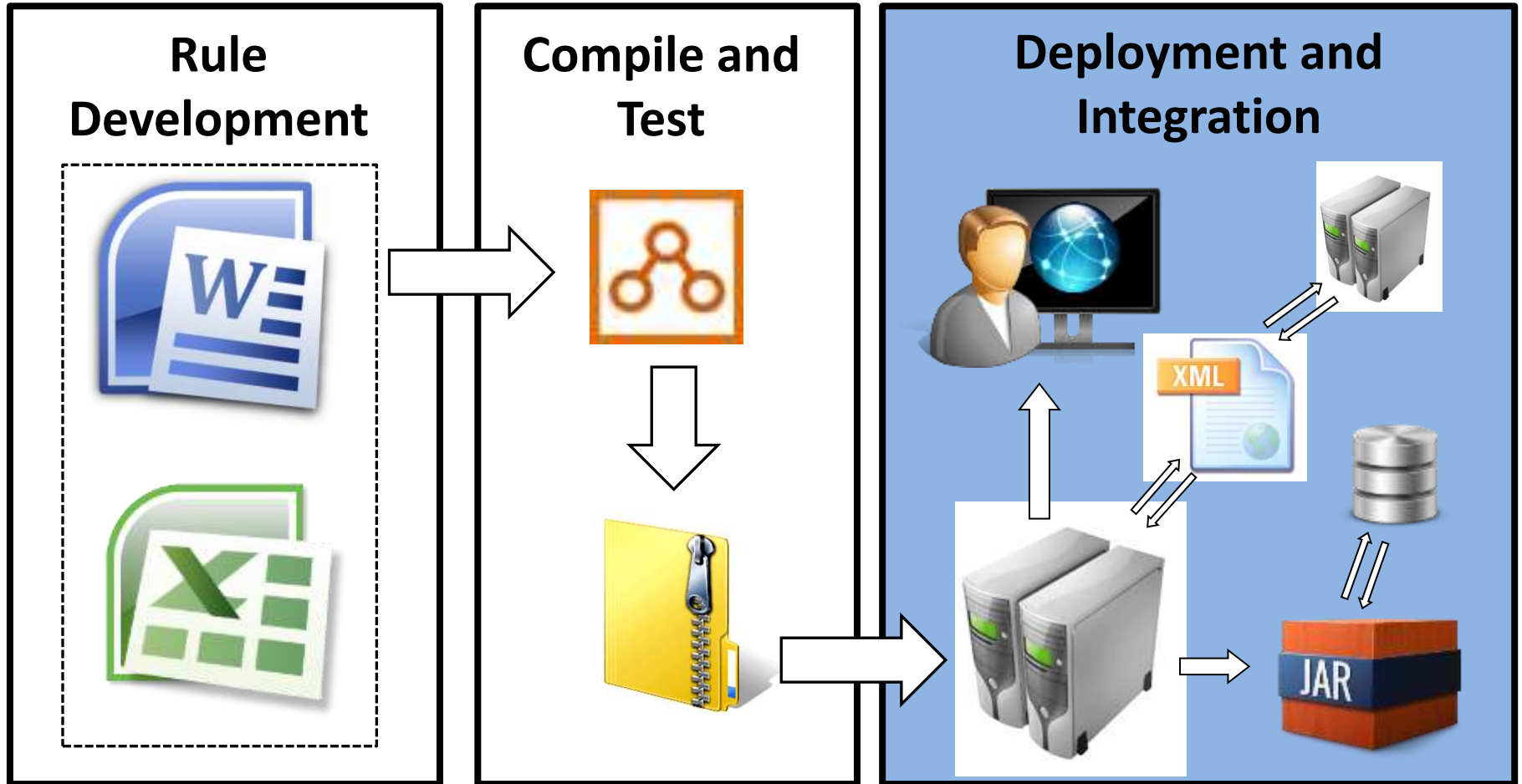
Deployment and Integration

Deployment and Integration

3 ways of accessing OPA:

- **Online interviews**

  (web determinations)

- **Web Service**

  (determinations server)

- **Batch Processor/API**

  (determination engine)

Web Determinations

- Self service interactive interviews

- Guides and estimates

- Knowledge base/call centre pages
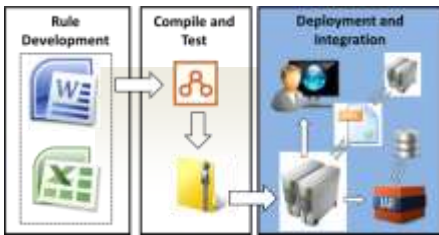
Example of Interview Screen

ORACLE Web Determinations

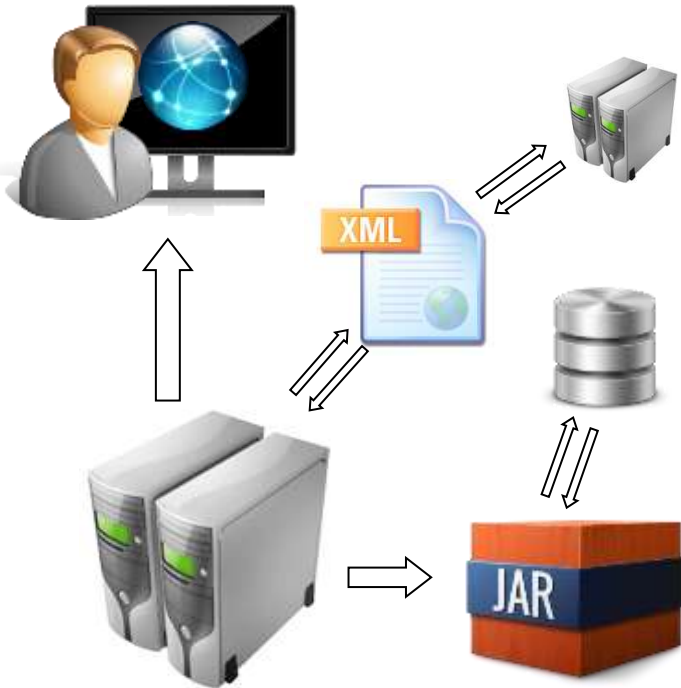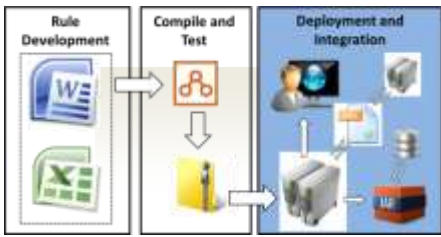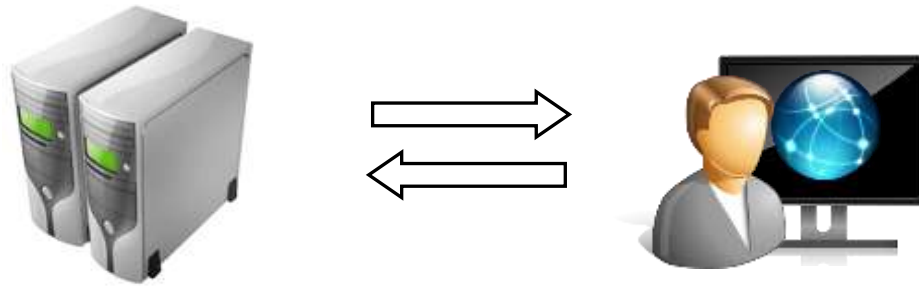Summary | Data Review   Save | Save As | Load | Restart | Close

Rulebase: OPA Demo Locale: en-US User ID: guest

The Customers Details

The Customers Details:

What is the person's first name?	* _____
What is the person's last name?	* _____
What is the person's date of birth?	* _____

What is the person's region?	* _____

Has the person's house been destroyed by the major disaster?	* ○ Yes ○ No
Has the person's job been terminated due to the major disaster?	* ○ Yes ○ No

Submit
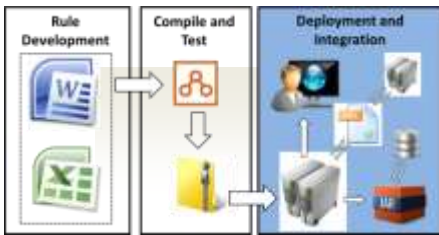
The person's total weekly major natural disaster grant is $245.00.

- The person's child amount component is $100.00.
  - all instances of The Child
    - Sam
  - The person's child component payment amount is $100.00.
    - The person's number of dependent children is 1.
      - all instances of The Child
      - Sam is a dependent child.
        - Sam's age is 14.
        - Sam is not financially independent.
- The regional payment component is $45.00.
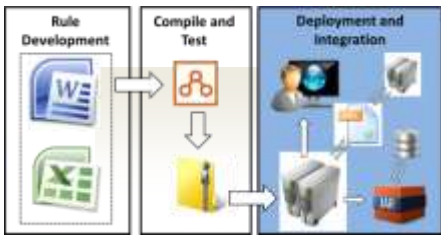 - The person's region is Lower North Island.
- The person's other factors component is $100.00.
  - The person is eligible for an other factors component.
    - The person's house has been destroyed by the major disaster.

Web Service

- SOA components

- B2B / API

- Back end processing
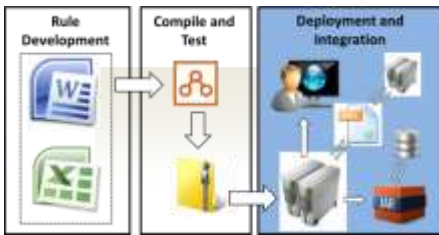
Example of SOAP Message

```xml
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:typ="http://orac
    <soapenv:Header/>
    <soapenv:Body>
        <typ:assess-request>
            <typ:global-instance>
                <typ:IN_personcustomerid>
                    <typ:number-val>6654545</typ:number-val>
                </typ:IN_personcustomerid>
                <typ:IN_persondob>
                    <typ:date-val>1977-07-05</typ:date-val>
                </typ:IN_persondob>
                <typ:IN_personfirstname >
                    <typ:text-val>Alex</typ:text-val>
                </typ:IN_personfirstname>
                <typ:IN_personincome >
                    <typ:number-val>88325</typ:number-val>
                </typ:IN_personincome>
                <typ:IN_personlastname>
                    <typ:text-val>White</typ:text-val>
                </typ:IN_personlastname>
                <typ:IN_personloanapplicationamount>
                    <typ:number-val>12000</typ:number-val>
                </typ:IN_personloanapplicationamount>
                <typ:IN_personsecurityvalue>
                    <typ:number-val>26000</typ:number-val>
                </typ:IN_personsecurityvalue>
```
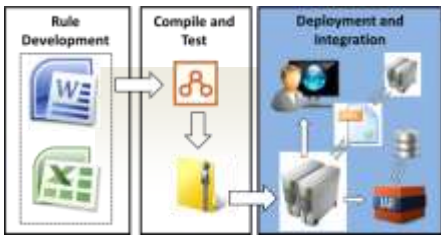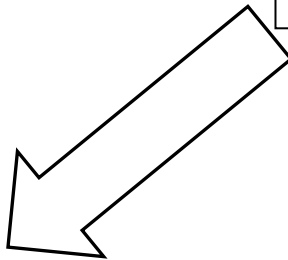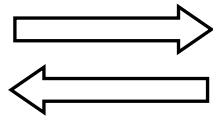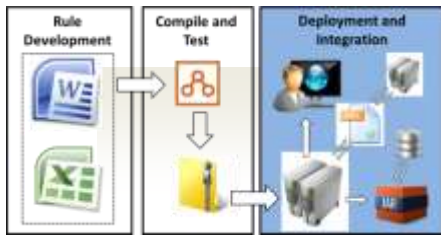
Web service as an API

TestProject

- /determinations-server/assess/soap/specific/TestProject?wsdl
- /determinations-server/assess/soap/generic/TestProject?wsdl
- /determinations-server/assess/soap/specific/10.4/TestProject?wsdl
- /determinations-server/assess/soap/generic/10.4/TestProject?wsdl
- /determinations-server/assess/soap/specific/10.3/TestProject?wsdl
- /determinations-server/assess/soap/generic/10.3/TestProject?wsdl

Determinations Engine

- Batch processing

- Tightly bound with java applications

- Highest number of transactions/sec

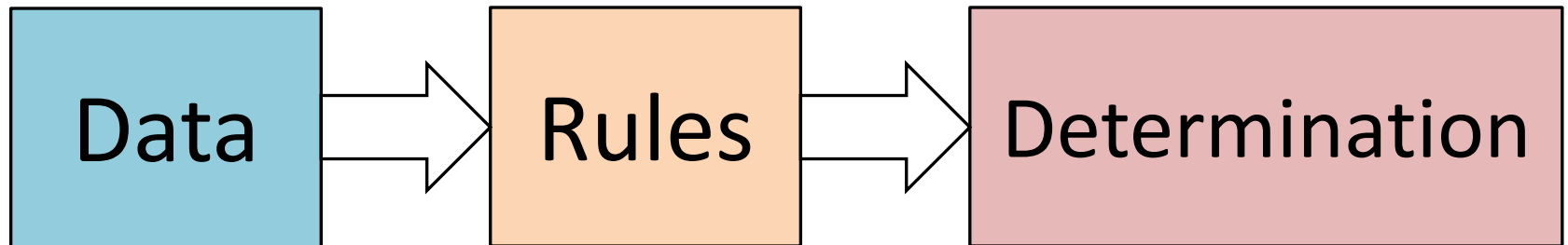# *Consistency across channels*
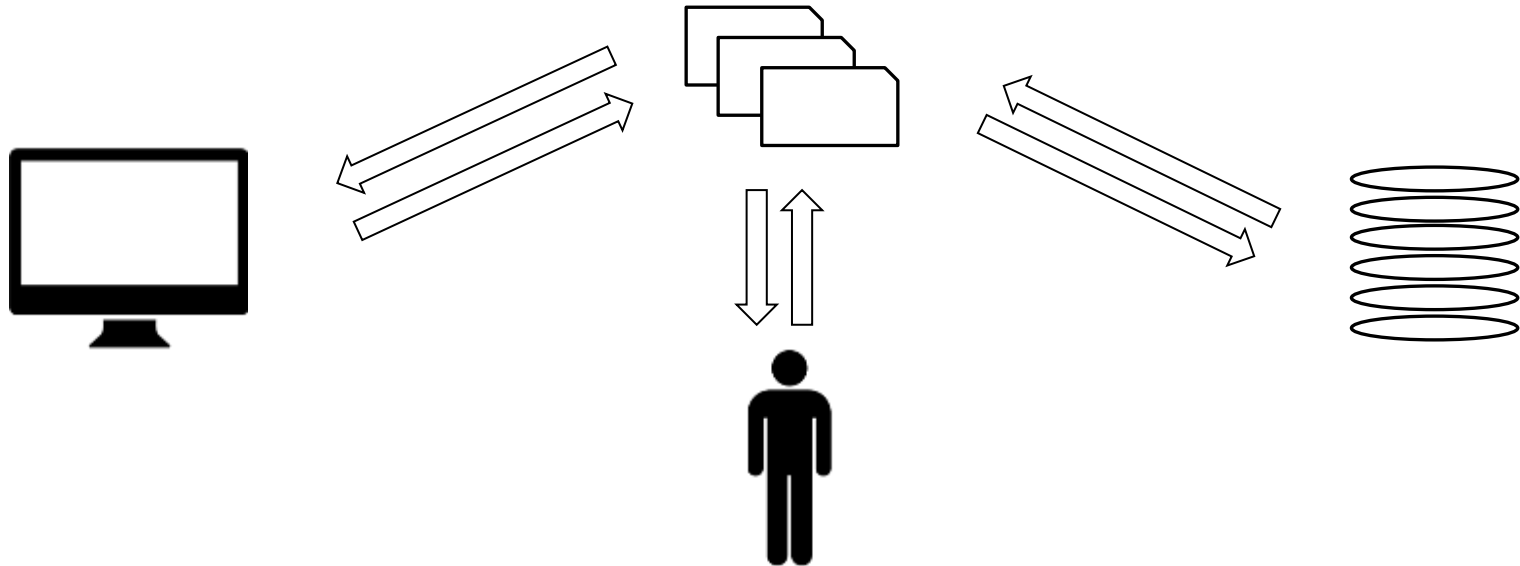
The same core rules are used to deliver the determination across all channels

Summary: Oracle Policy Automation

Data	→	Rules	→	Determination

- Complex or simple, structured data

- Complex or simple rules

- Consistent and auditable determinations

In summary:

What happens when you externalise your business rules with OPA:

- Single set of rules, **reused** across all applications

- Streamlined, quick and easy **changes** to rules

- Reduced IT dependencies with business ownership of business rules

Questions?

Looking for more information?
OPA in Social Media:

https://twitter.com/OracleOPA

http://www.facebook.com/pages/Oracle-Policy-Automation/36552292019910

http://www.linkedin.com/groups/Oracle-Policy-Automation-3431282/about

http://www.youtube.com/user/OraclePAVideos

https://forums.oracle.com/forums/forum.jspa?forumID=828

Other materials
(for those downloading this slide show)

Maximizing Performance and Scalability of a Policy Automation Solution

June 2010, Davin Fifield:

http://www.oracle.com/technetwork/apps-tech/policy-automation/learnmore/opaonengineeredsystemswhitepaper-1713414.pdf

Is Oracle Policy Automation a Good Fit for My Business?

May 2012, Jasmine Lee:

http://www.oracle.com/technetwork/apps-tech/policy-automation/learnmore/isopaagoodfitformybusiness-1653261.pdf

State of Texas Employees Retirement System (ERS)

2012, Accenture:

http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-Employees-Retirement-System-Business-Rules-Engine.pdf