



## **M2M Vision for B/OSS**

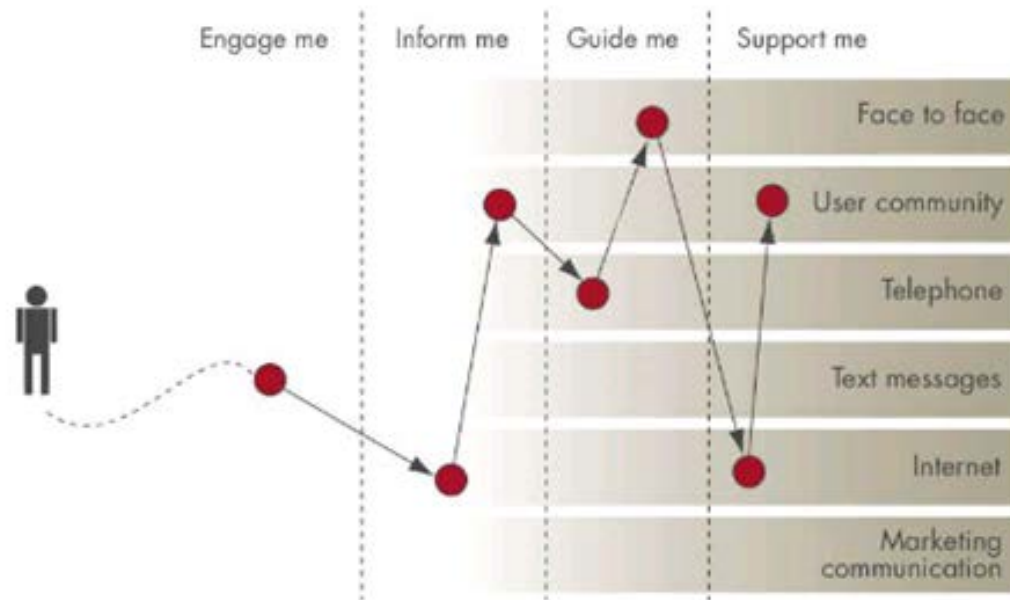
Realize an open and nimble Backoffice that enables rather than inhibits the M2M business model.

## **M2M Mission for B/OSS**

- Improve information flow between Backoffice and M2M devices.
- Promote adoption of a common vocabulary for Backoffice domains to facilitate M2M communication.
- Define standard interfaces to enable M2M device communication with key Backoffice business assets.
- Enable industry collaboration to evolve common vocabulary and interfaces
- Enable rapid transformation of Backoffice components
- Improve device visibility and service assurance

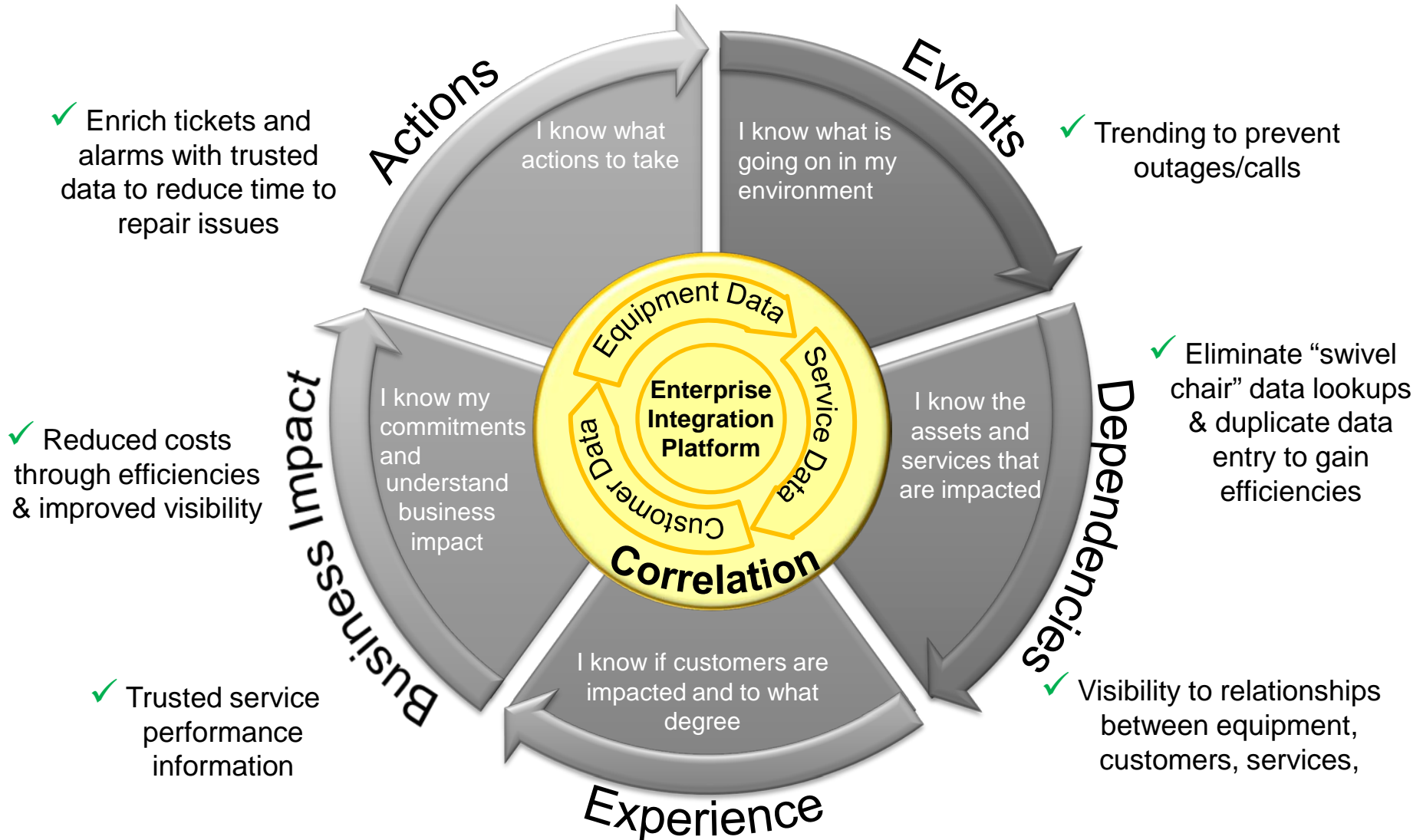
# Provide the foundation needed to improve customer experience

The service is seen as a **journey** through touchpoints, over time and across channels.



Common data models and semantics enable implementation of tools at different touchpoints to inform, guide and support.

✓ **Proactive and Preventive Capabilities Achieved**



# Personalization

## Preferences

*"The stuff you tell us."*

- Policy Controls
- Personal Controls
  - Parental Controls
  - Notification Controls
  - Business Controls
- Ad-Hoc
- Favorites
  - Address Books
  - Configurations

## Profile

*"The stuff we know 'cuz you bought it from us."*

- Subscriptions
- Packages
- Bundles
- Features
- Accounts
- Account Controls

## Context

*"The stuff we watch you do."*

- Real-time monitoring
- Historical logs
- Content viewed
- Actions taken
- "Traffic analysis"

## Leverage existing standards and specs

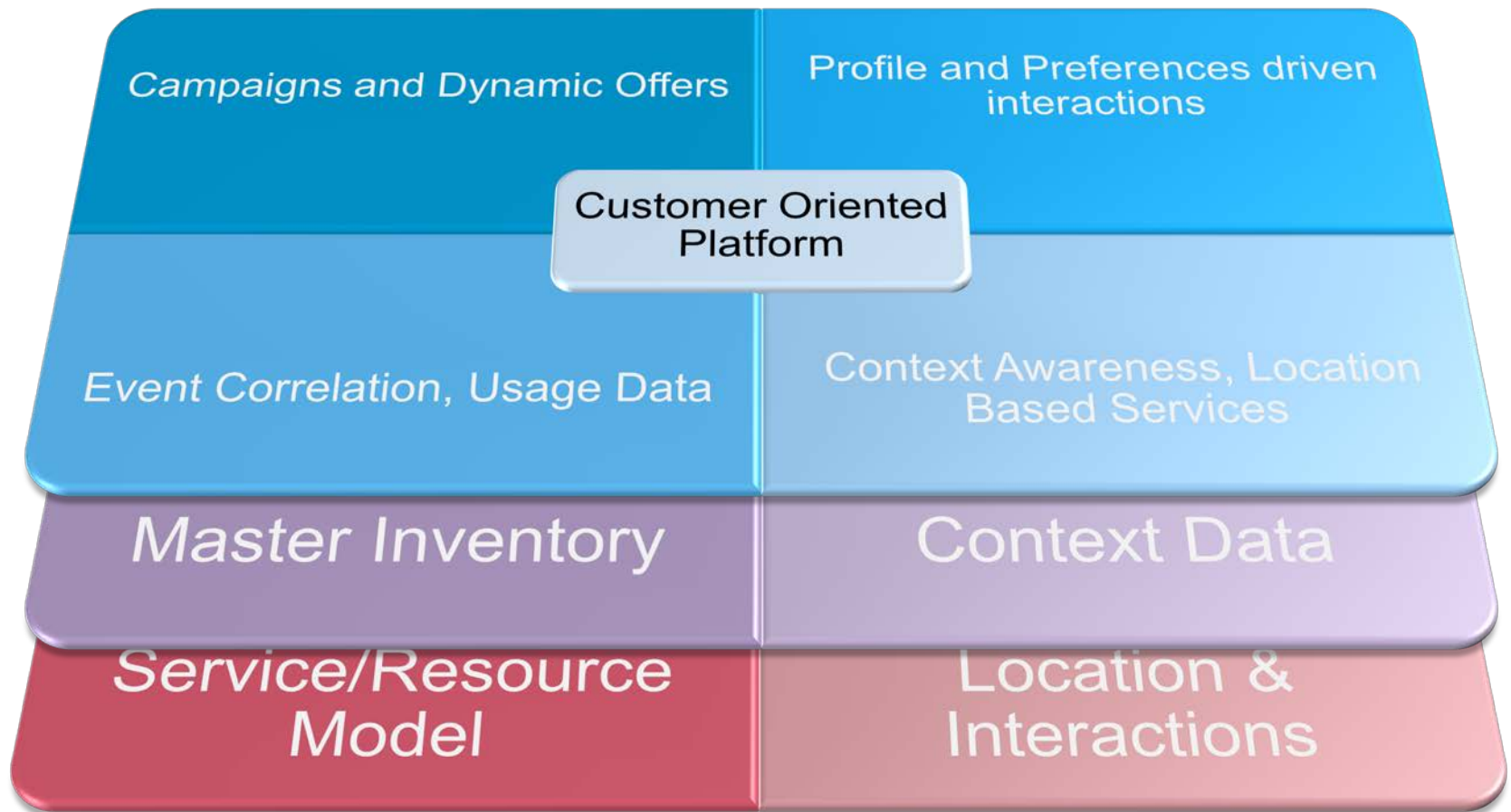




The CableLabs® Operations Framework project supports CableLabs members in creating an open, responsive back office that makes it simpler and faster to deploy new products and services. By providing members with new business and operations systems architectures and interfaces, Operations Framework helps them optimize operational efficiency and improve customer experience.

# Operations Framework

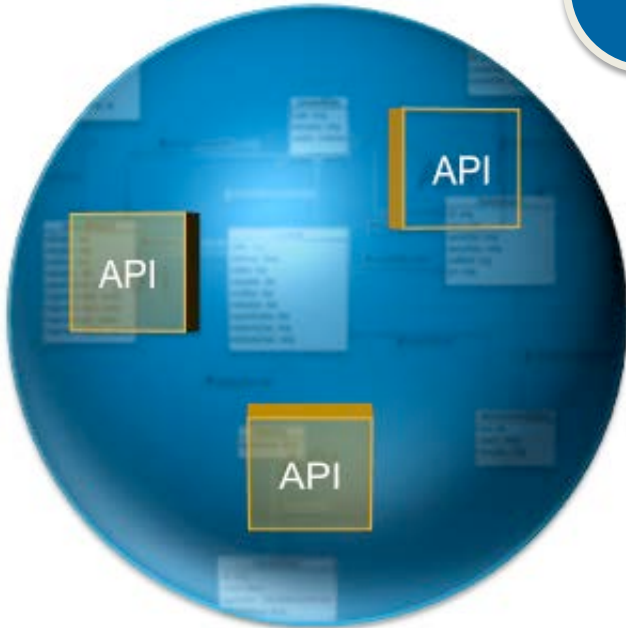
A Reference Architecture for Enabling Backoffice and Service Delivery





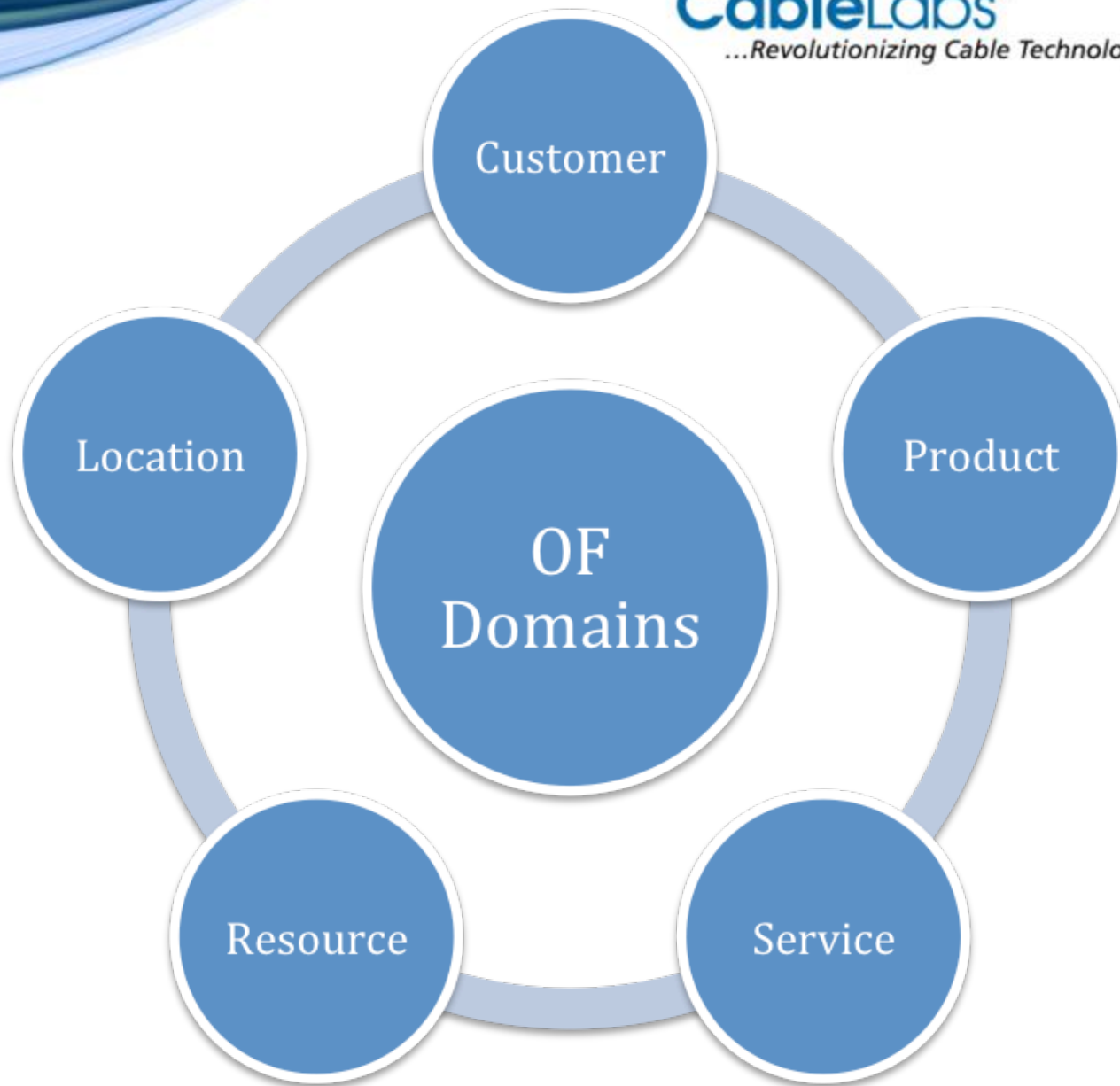


Define Foundation  
for Architecture



CableLabs Reference Information Model | Level 2/3 | Revision v3.0-DRAFT | CableLabs®

Marketing/Sales		Product		Customer		Service		Resource		Supplier/Partner		Enterprise (Corporate)														
Computer	Contact List/Process	Service Request	Market Strategy	Market Area	Marketing Campaign	Sales Channel	Sales Station	Product	Product Line	Product Substitution	Agmt	Contract Location	Contract End/Start	Contract Renewal	Contract Order	Contract Type	Contract Status	Contract Location	Contract Order	Contract Type	Contract Status	Contract Location	Contract Order	Contract Type	Contract Status	
Customer	Customer Profile	Customer Problem	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill	Customer Bill
Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service	Service
Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource	Resource
Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner	Supplier/Partner
Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)	Enterprise (Corporate)



# CableLabs Reference Information Model | Level 2/3

Key  
MSO Extensions within Package

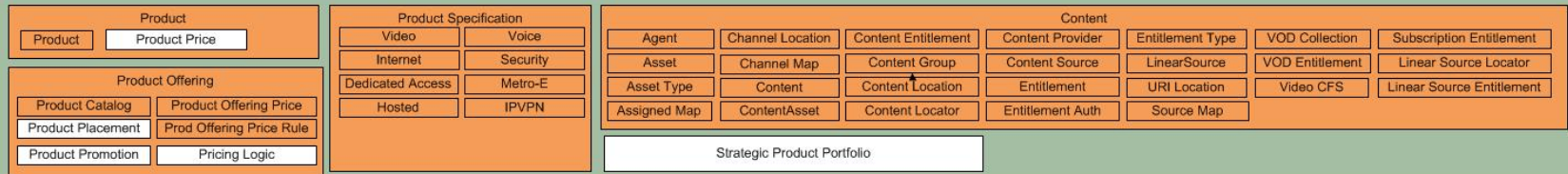
Revision v3.0-DRAFT1  
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## Marketing/Sales



## Product

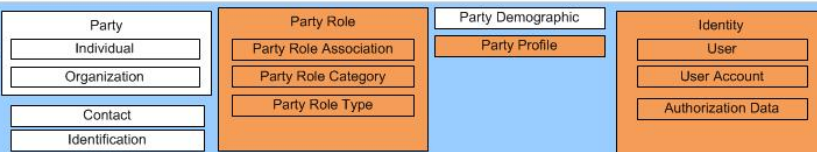


## Customer

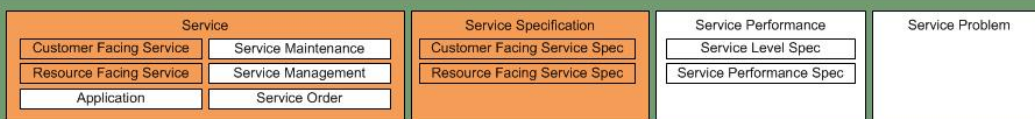


## Party

(part of Common)



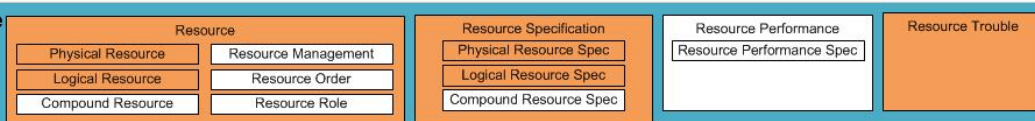
## Service



## Usage Data



## Resource



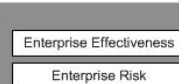
## Supplier/Partner



## Common Business



## Enterprise (Corporate)



Extended from



Shared Information  
Data Model v9.5





# An API for the BackOffice

## CableLabs Operations Framework

### Proposed List of Interfaces derived from Information Model

- Inventory(Service/Resource)
- Customer
- Location
- Product/Offer
- Identity
- Trouble Tickets
- Change
- Asset
- Fault
- Performance
- Billing/Payment



# RESTful API – Core Design Principles

- Client-Server
- Stateless
- Cacheable
- Layering
- Uniform Interface
- Resource-centric
- Long lived URIs
- Multiple representation
- HATEOAS

Resource	POST	GET	PUT	DELETE
/productcatalogs	create a new catalog 201 Created 400 Bad Request	list catalogs 200 OK 404 Not Found	bulk update catalogs 200 OK 400 Bad Request	delete all catalogs 204 No Content 401 Unauthorized
/productcatalogs/123	error 405 Method Not Allowed	show catalog 123 200 OK 404 Not Found	if exists update catalog 200 OK 400 Bad Request  if not error 412 Precondition Failed	delete catalog 123 204 No Content 401 Unauthorized 404 Not Found



## JSON Payloads – Custom Media Types

```
application/vnd.yourcompany.resource+json
```

```
application/vnd.yourcompany.resource+xml
```

```
{  
  "physicalDevice": {  
    "self": "http://api.cablelabs.com/physicaldevices/BTRGLA741AW 01.005.31.04 ALU 7  
    "physicalDeviceId": "BTRGLA741AW 01.005.31.04 ALU 7750#1 SR-12 (172.24.153.2)",  
    "manufactureDate": "",  
    "physicalDeviceSpecification" : {  
      "self": "http://api.cablelabs.com/physicaldevicespecifications/ALCATEL-LUCENT 77  
      "physicalDeviceSpecID" : "ALCATEL-LUCENT 7750 SR-12 3HE00104AAAC02 500 DC ROUTER  
      "modelName": "SR-12 3HE00183BA 500 DC ROUTER</modelName",  
      "vendorName" : "ALCATEL-LUCENT",  
      "height" :24,  
      "width": 17,  
      "depth" : 25  
    },  
    "deviceGroupID": "BTNR77500531X",  
    "versionNumber": "8.3",  
    "serialNumber": "0096772",  
    "physicalDeviceRole": [  
      {
```



# JSON MetaData Bindings

```
1 {
2   "package-name" : "com.cablelabs.opsframework.product.domain.productofferingabe",
3   "xml-accessor-type" : "NONE",
4   "xml-schema" : {
5     "element-form-default" : "QUALIFIED",
6     "namespace" : "http://www.example.com/customer"
7   },
8   "java-types" : {
9     "java-type" : [ {
10      "name" : "ProductOffering",
11      "xml-root-element" : {},
12      "java-attributes" : {
13        "xml-element" : [
14          {"java-attribute" : "productOfferingId"},
15          {"java-attribute" : "name"},
16          {"java-attribute" : "description"},
17          {"java-attribute" : "status"},
18          {"java-attribute" : "validFor", "type" : "com.cablelabs.opsframework.cbed.basetypesabe.TimePeriod"}
19        ]
20      },
21      "xml-type" : {
22        "prop-order" : ""
23      }
24    }
25  ]
26 }
```



Connected Sensors and Devices



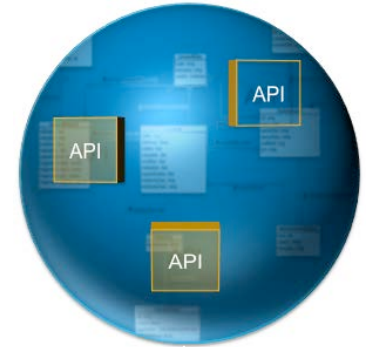
M2M Service Delivery Platform

API Exposure

Data Collection

Data Correlation

**Interfaces**



**Information Model**



BackOffice Platforms

## What the future “machines” could look like to the BackOffice?

- Self discoverable interfaces
- Dynamic data payloads
- Dynamic communication of state
- Dynamic communication of actions
- Smart devices or Smart device clouds
- Embedded agents