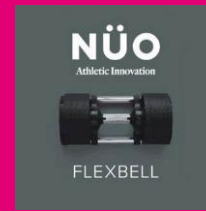


# ERT Prequal Development with Appian

James Liu, Geol "Chris" Kim  
9/3/2021

# Geol "Chris" Kim

- School: UW-Bothell
- Major: Computer Science
- Hobbies: Movies, Soccer, Longboarding, Brewing Tea, Exercise
- ERT Development Team (Digital)
- Reporting to Prakash Balagurunathan & Bonnie Salyer



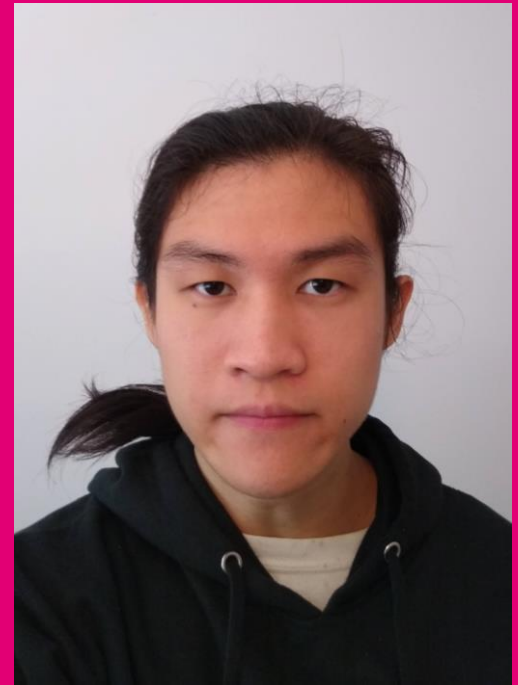
T-Mobile Confidential





# James Liu

- School: University of Washington
- Major: Computer Science
- Hobbies: Powerlifting, video games
- ERT Development Team (Digital)
- Reporting to  
Prakash Balagurunathan & Bonnie Salyer



# What We've Been Up To

- Appian Development
- ERT Applications
  - Filtering Checkboxes
  - CR14
  - CR12
- Implementing requested features and changes
  - Review by senior developers, evaluation by end users





## Week 1-4

Onboarding, learning Appian, ERT codebase, and other tools in tech stack (SOAP UI, SQL dev)

## Week 5

Begin working on small change requests to codebase: Conditional instructions, Record type filter

## Week 6-9

Assigned larger deliverables: Filtering checkboxes, Change Request 14

## Week 10-12

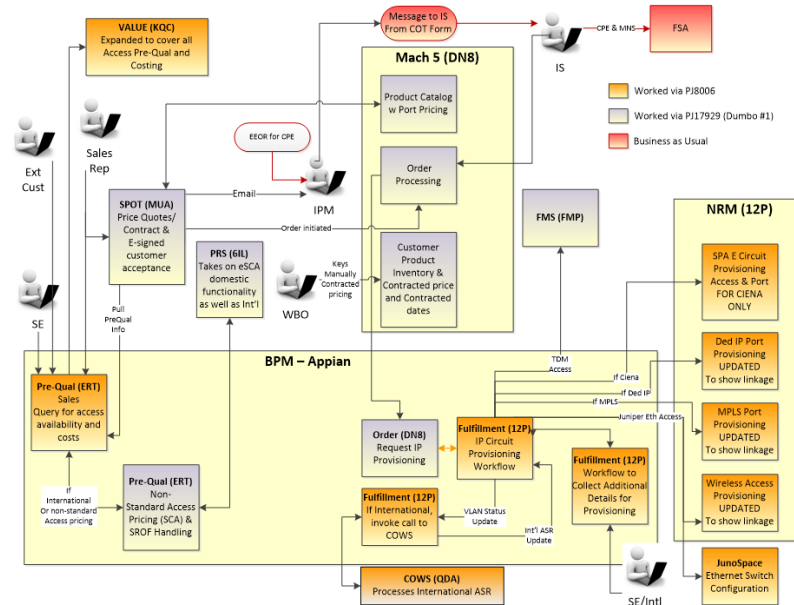
SMARTER presentations and Change Request 12

## End of Internship

Back to school

# Knowledge Transfer Sessions

- Daily sessions reviewing the codebase & completing assigned deliverables
  - Appian
  - ERT codebase
  - Tech stack (SOAP UI, SQL dev)

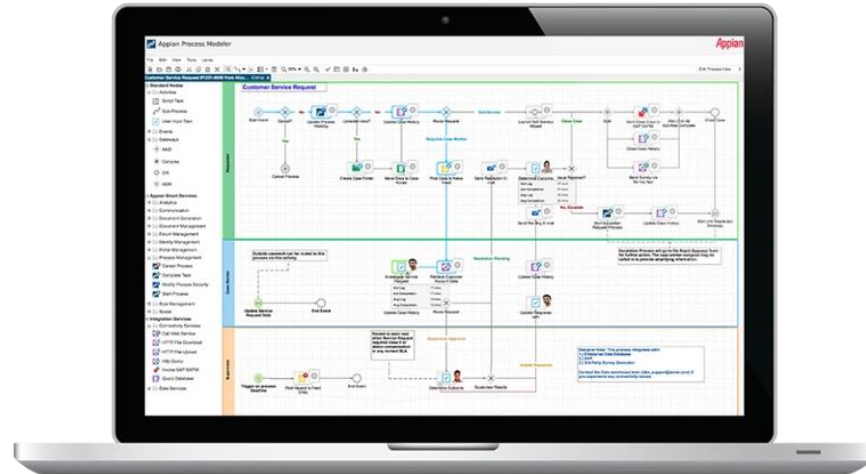




# Appian

## Development Platform

- Low-code business process automation tool
- Very different from other technologies we have used in the past
- Multiple, layered environments for deployment



# SoapUI

## API Testing Tool

- Used in conjunction with Appian's Process Activity Monitoring system to test web services



The screenshot displays the SoapUI interface. The top pane shows the raw XML of a SOAP request to `https://appiantest3.test.sprint.com/suite/webservice/processmodel/CPEWebServiceHatTrickAction`. The request includes fields for `username`, `password`, `deviceIds`, `msgType`, `preQualCriteriaID`, `quoteLineAccess`, `quoteLineCPE`, `quoteLineItemID`, and `templateIds`. The bottom pane shows the raw XML of the SOAP response, which includes `processId` and `apn` fields.


	Process Name	Process Model	Errors	Started By	Active Tasks	Start Time	End Time
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000021402	CPE_68R_newReviewCpe (8.0)	-	ERT PreQual Tool	0	8/26/2021 4:54 AM	8/26/2021 4:54 AM
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000021402	CPE_68R_newReviewCpe (8.0)	-	ERT PreQual Tool	0	8/26/2021 3:43 AM	8/26/2021 3:43 AM
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000021402	CPE_68R_newReviewCpe (8.0)	-	ERT PreQual Tool	0	8/25/2021 4:10 PM	8/25/2021 4:10 PM
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000023212	CPE_68R_newReviewCpe (8.0)	-	ERT PreQual Tool	1	8/24/2021 2:41 AM	
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000023212	CPE_68R_newReviewCpe (8.0)	-	ERT PreQual Tool	1	8/23/2021 9:24 AM	
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000023212	CPE_68R_newReviewCpe (8.0)	-	ERT PreQual Tool	1	8/19/2021 11:32 AM	
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000021402	CPE_68R_newReviewCpe (4.0)	1	ERT PreQual Tool	0	8/18/2021 3:15 PM	
<input type="checkbox"/>	<input checked="" type="checkbox"/> CPE_68R_newReviewCpe for QL0000021402	CPE_68R_newReviewCpe (3.0)	1	ERT PreQual Tool	0	8/18/2021 3:13 PM	



# Oracle SQL Developer

## Database Tool

- Used for working with databases (known as data stores in Appian)
- Table structures
- Test data



ERT\_Dev3.sql CPE\_DEV

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Actions...

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1 CPE_DEV_ID	VARCHAR2(10 BYTE)	No	(null)		1 CPE Device ID unique for a device and version
2 ADD_DT	DATE	No	(null)		2 CPE Device added date
3 ADD_BY_ID	VARCHAR2(32 BYTE)	No	(null)		3 CPE Device added by
4 CPE_PREQUAL_SITE_ID	VARCHAR2(11 BYTE)	Yes	(null)		4 CPE Prequal Site ID
5 CPE_DEV_STUS_NME	VARCHAR2(40 BYTE)	No	'INDESIGN'		5 CPE Device Status. INDESIGN, INCART, ORDERED, CANCELLED.
6 ADD_MTHN_NMFP	UND/HH24:00:00	No	'MANUAL'		6 Store the filename of the EROD or MANINT if entered manually

ERT\_Dev3.sql CPE\_DEV

SQL Worksheet | History

Query Builder

```
SELECT * FROM CPE_DEV
WHERE RAC_TRACK_REQ_ID IS NOT NULL AND QOT_PREQ_CRIT_ID IS NOT NULL;

SELECT * FROM CPE_DEV
WHERE CPE_SITE_ID='0020000455764';

SELECT * FROM PREQUAL_AUDIT;

SELECT * FROM CPE_DEV;

INSERT INTO CPE_DEV (CPE_DEV_ID,
ADD_DT,
ADD_BY_ID,
CPE_DEV_STUS_NME,
ADD_MTHN_NMFP,
VER_ID,
DEV_DES,
CPE_SITE_ID,
RAC_TRACK_REQ_ID,
QOT_PREQ_CRIT_ID)
VALUES ('5649', TO_DATE('18/08/2021', 'DD/MM/YYYY'), 'jlu37', 'FINAL', 'MANUAL', 1, 'BendroisCPE test', '002000021402', 0000027796);
```



# Small Fixes

## Conditional Instructions

Pricing Type ☒ EOF NEARNET

☒ EOF ONNET

☒ EOFW

All EoFW orders and quotes are subject to physical site survey from the Access vendors - Windstream & TelePacific (TPX). EoFW orders with Wind Stream and TPX will be put on hold, if the customer is unable to secure rooftop rights for installation of Wireless equipment from the property owner/landlord, after an order is submitted.

## Record Type Filter

### PreQual Special Handling Requests

REQUEST TYPE | Any

Any

Diversity Required

Failed Geocoding

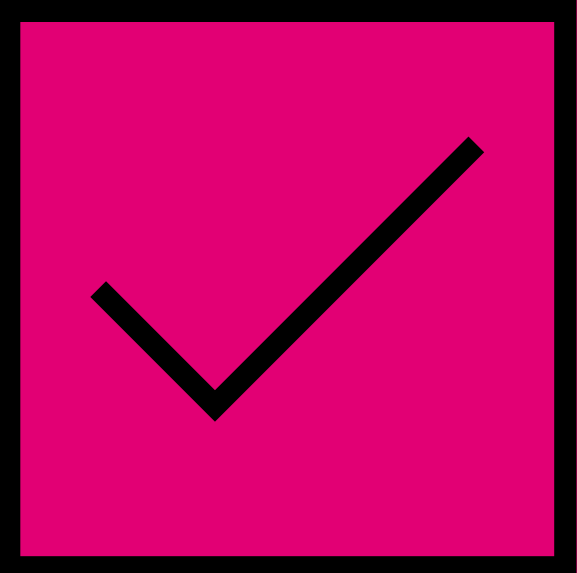
Non-SPA Request

Pricing Review

Request ID	Customer	PreQual Site	Manager	Date Requested

# Filtering checkboxes

## Adding filtering functionality to an existing interface



**COPYFV.ERT.PREQUAL.ROFR.Refresh.Results.PreDepurping.Review** | DESIGN MODE | EXPRESSION MODE

**Review Refreshed Pricing Results**

**Prequal Site Info**

Prequal Site ID: [blank] Customer: [blank]

Address: [blank]

**New Pricing Results**

The new pricing results and the Site's existing Line Items are displayed below. Please review the results to determine whether you'd like to proceed with the pricing refresh. If you proceed, some of the existing Line Items may be cancelled if newer pricing is present. Cancel if you don't wish to use the new pricing. Use the Next button to proceed with the new pricing.

**Vendor**

- ☒ Centurylink
- ☒ Comcast
- ☒ T-Mobile
- ☒ 2ply Fiber

**Pricing Type**

- ☒ EOC
- ☒ EOF ONNET
- ☒ EOFW

**Bandwidth**

- ☒ 1M
- ☒ 2M
- ☒ 20M
- ☒ 100M

**Terms**

- ☒ 1 year
- ☒ 2 years
- ☒ 3 years

**Ethernet Type**

- ☒ Aggregated
- ☒ Dedicated

**Class of Service**

- ☒ BASIC
- ☒ Blank
- ☒ INTERMEDIATE
- ☒ PREMIUM

EOC pricing is subject to site survey. Vendor does not own the copper infrastructure on the premise for this product. They are dependent on other EOCs for using their copper infrastructure as their last mile. The copper facilities, especially, are not identified until the order is placed and the capacity is confirmed. Therefore, orders could be rejected after site survey if the necessary copper facilities are unavailable at a site. All order orders and quotes are subject to physical size survey from the Access Vendors. Wireman team and TTS will be put on hold. If the customer is unable to secure rooftop rights for installation of wireless equipment from the property owner/landlord, offer an order is submitted.

Bandwidth	Term	Vendor	Vendor Type	Hand-off Type	Ethernet Type	Pricing Type	Class of Service	MRC	NRC	Target Launch Date	Rating
1M	3	Comcast		A	EOC	BASIC					
2M	3	Centurylink		D	EOFW	PREMIUM					
20M	2	Comcast		A	EOC ONNET	INTERMEDIATE					

**regexp: predicate, list, concat**

Calls predicate, a rule or function that returns either true or false for each item in list, rejecting the items for which the returned value is true, and returning the leftover items. Given a function `isurl`, `regexp(isurl, 1, null)`, 30 yields (1, 3). An optional context argument can be passed directly into every evaluation. To use rules or functions that take multiple arguments, use the merge function e.g. given a rule `gls.isurl`, `regexp(merge(gls, 1), 1, 0)`, 4 yields 1.

**Returns:** Any Type

**predicate:** Rule or function (Reference): Rule or expression function that returns a boolean (true or false). Use `functionname` to reference an expression function and `ruleName` to reference a rule.

**list:** (Any Type): List of elements that predicate iterates through.

**context:** (List of Variants): Variable number of parameters passed directly into each predicate evaluation.

**appian**

**Variables**

- Name**
- Value**
- buttonAction**: null
- existingLineItems\_cst** (5 items): [PREQUAL\_SITE\_ID, PREQUAL...
- [1]**: [PREQUAL\_SITE\_ID, PREQUAL...
- PREQUAL\_SITE\_ID**: null
- PREQUAL\_SITE\_ITEM\_ID**: null
- BDWD\_NAME**: 1M
- ACCS\_TYPE\_CD**: null
- ETH\_ACCS\_TYPE\_CD**: A
- VNDR\_NAME**: Comcast
- TERM\_NAME**: 3
- WINDUP\_TYPE\_CD**: null
- EOC\_ACCS\_NRC\_AMT**: null

**LOCAL VARIABLES**

- Name**
- Value**
- filteredThermetData** (5 items): [PREQUAL\_PS\_SITE\_ID, PREQ...
- eth\_term\_ArrayUnsorted** (3 L...): [3; 2; 1]
- eth\_term\_Array** (3 items): [1; 2; 3]
- eth\_type\_Ptr\_List** (2 items): [A; D]
- eth\_bandwidth\_array** (4 items): [1M; 2M; 20M; 100M]
- eth\_type\_List** (2 items): [A; D]
- pricing\_type\_temp** (4 items): [EOC; EOCFW; EOC ONNET; EOC ...]
- [1]**: EOC
- [2]**: EOCFW
- [3]**: EOC ONNET
- [4]**: EOC ONNET
- pricing\_type\_List** (4 items): [EOC; EOCFW; EOC ONNET; EOC ...]
- [1]**: EOC
- [2]**: EOCFW
- [3]**: EOC ONNET
- [4]**: EOC ONNET
- pricing\_type\_array\_values** (4...): [EOC; EOCFW; EOC ONNET; EOC ...]
- [1]**: EOC
- [2]**: EOCFW
- [3]**: EOC ONNET
- [4]**: EOC ONNET

# Before changes and Mock-up

### Review Refreshed Pricing Results

**Prequal Site Info**  
Prequal Site ID 50003452  
Address 1000 Main St, Houston, TX 75002 - US

Customer C002569 - 915678345 - ACME Inc

! The new pricing results and the Site's existing Line Items are displayed below. Please review the results to determine whether you'd like to proceed with the pricing refresh. If you proceed, some of the existing Line Items may be cancelled if newer pricing is present. Cancel if you don't wish to use the new pricing. Use the Next button to proceed with the new pricing.

**New Pricing Results**

Bandwidth	Term	Vendor	Vendor Type	Hand-off Type	Ethernet Type	Pricing Type	Class of Service	MRC	NRC	Target Launch Date	Rating	Construction Probability	Expedite Eligible
5M	1	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	965	0	Available	No Rating Available	MEDIUM	YES
5M	1	CENTURYLINK	AAV	STD	A	EOF NEARNET	BASIC	625	0	Available	No Rating Available	MEDIUM	YES
5M	2	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	925	0	Available	No Rating Available	MEDIUM	YES
5M	2	CENTURYLINK	AAV	STD	A	EOF NEARNET	BASIC	600	0	Available	No Rating Available	MEDIUM	YES

**Existing Line Items**

Prequal Line Item ID	Bandwidth	Term	Vendor	Vendor Type	Hand-off Type	Ethernet Type	Pricing Type	Class of Service	MRC	NRC	Target Launch Date	Rating	Construction Probability	Expedite Eligible
L000345289	5M	1	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	965	0	Available	No Rating Available	MEDIUM	YES
L000345289	5M	1	AT&T - LEC	LEC	STD	A	EOF NEARNET	BASIC	750	0	Available	No Rating Available	MEDIUM	YES
L000345289	5M	2	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	925	0	Available	No Rating Available	MEDIUM	YES
L000345289	5M	2	AT&T - LEC	LEC	STD	A	EOF NEARNET	BASIC	700	0	Available	No Rating Available	MEDIUM	YES

CANCEL

NEXT

### Review Refreshed Pricing Results

**Prequal Site Info**  
Prequal Site ID 50003452  
Address 1000 Main St, Houston, TX 75002 - US

Customer C002569 - 915678345 - ACME Inc

! The new pricing results and the Site's existing Line Items are displayed below. Please review the results to determine whether you'd like to proceed with the pricing refresh. If you proceed, some of the existing Line Items may be cancelled if newer pricing is present. Cancel if you don't wish to use the new pricing. Use the Next button to proceed with the new pricing.

**Vendor**  
☒ AT&T  
☒ Centurylink

**Bandwidth**  
☒ 5M

**Term**  
☒ 1 Year  
☒ 2 Years

**Pricing Type**  
☒ EOF NEARNET

**Class of Service**  
☒ BASIC  
☒ PREMIUM

**Ethernet Type**  
☒ A

**New Pricing Results**

Bandwidth	Term	Vendor	Vendor Type	Hand-off Type	Ethernet Type	Pricing Type	Class of Service	MRC	NRC	Target Launch Date	Rating	Construction Probability	Expedite Eligible
5M	1	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	965	0	Available	No Rating Available	MEDIUM	YES
5M	1	CENTURYLINK	AAV	STD	A	EOF NEARNET	BASIC	625	0	Available	No Rating Available	MEDIUM	YES
5M	2	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	925	0	Available	No Rating Available	MEDIUM	YES
5M	2	CENTURYLINK	AAV	STD	A	EOF NEARNET	BASIC	600	0	Available	No Rating Available	MEDIUM	YES

**Existing Line Items**

Prequal Line Item ID	Bandwidth	Term	Vendor	Vendor Type	Hand-off Type	Ethernet Type	Pricing Type	Class of Service	MRC	NRC	Target Launch Date	Rating	Construction Probability	Expedite Eligible
L000345289	5M	1	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	965	0	Available	No Rating Available	MEDIUM	YES
L000345289	5M	1	AT&T - LEC	LEC	STD	A	EOF NEARNET	BASIC	750	0	Available	No Rating Available	MEDIUM	YES
L000345289	5M	2	AT&T - LEC	LEC	STD	A	EOF NEARNET	PREMIUM	925	0	Available	No Rating Available	MEDIUM	YES
L000345289	5M	2	AT&T - LEC	LEC	STD	A	EOF NEARNET	BASIC	700	0	Available	No Rating Available	MEDIUM	YES



# Result

## Review Refreshed Pricing Results

### Prequal Site Info

Prequal Site ID  
Address

Customer

**!** The new pricing results and the Site's existing Line Items are displayed below. Please review the results to determine whether you'd like to proceed with the pricing refresh. If you proceed, some of the existing Line Items may be cancelled if newer pricing is present. Cancel if you don't wish to use the new pricing. Use the Next button to proceed with the new pricing.

#### Vendor

- ☒ Centurylink
- ☒ Comcast
- ☒ Google Fiber
- ☒ T-Mobile
- ☒ Ziply Fiber

#### Pricing Type

- ☒ EOC
- ☒ EOF NEARNET
- ☒ EOF ONNET
- ☒ EOFW
- ☒ EWGF

#### Bandwidth

- ☒ 1M
- ☒ 2M
- ☒ 20M
- ☒ 100M
- ☒ 2G

#### Class of Service

- ☒ BASIC
- ☐ Blank
- ☒ INTERMEDIATE
- ☒ PREMIUM

#### Term

- ☒ 1 year
- ☒ 2 years
- ☒ 3 years
- ☒ 4 years

#### Ethernet Type

- ☒ Aggregated
- ☒ Dedicated

EOC pricing is subject to site survey. Vendor does not own the copper infrastructure on the premise for this product. They are dependent on other LECs for using their copper infrastructure as their last mile. The copper facilities, capacity, etc. are not identified until the order is placed and the capacity is confirmed. Therefore, orders could be rejected after site survey if the necessary copper facilities are unavailable at a site. | All EOFW orders and quotes are subject to physical site survey from the Access vendors - Windstream & TelePacific (TP). EOFW orders with Windstream and TP will be put on hold, if the customer is unable to secure rooftop rights for installation of Wireless equipment from the property owner/landlord, after an order is submitted.

### ▼ New Pricing Results

Bandwidth	Term	Vendor	Vendor Type	Hand-off Type	Ethernet Type	Pricing Type	Class of Service	MRC	NRC	Target Launch Date	Rating	Construction Probability	Expedite Eligible
1M	3	Comcast			A	EOC	BASIC						
2M	3	Centurylink			D	EOFW	PREMIUM						
20M	2	Comcast			A	EOF ONNET	INTERMEDIATE						

### Existing Line Items

Prequal Line Item ID	Bandwidth	Term	Vendor	Vendor Type	Hand-off Type	Ethernet Type	Pricing Type	Class of Service	MRC	NRC	Target Launch Date	Rating	Construction Probability	Expedite Eligible
	1M	3	Comcast			A	EOC	BASIC						
	2M	3	Centurylink			D	EOFW	PREMIUM						
	20M	2	Comcast			A	EOF ONNET	INTERMEDIATE						
	2G	4	Google Fiber			D	EWGF	PREMIUM						

CANCEL

NEXT







# Change Request 14

## ERT CPE Web Service

- Added functionality for Sales to request CPE Re-review via Hat Trick
- Additional top-level process model branch
- Refactoring existing code for better readability

The screenshot displays a web browser window with the URL `https://appiantest3.test.sprint.com/suite/webservice/processmodel/CPEWebServiceHatTrickAction`. The browser shows a SOAP request on the left and a SOAP response on the right.

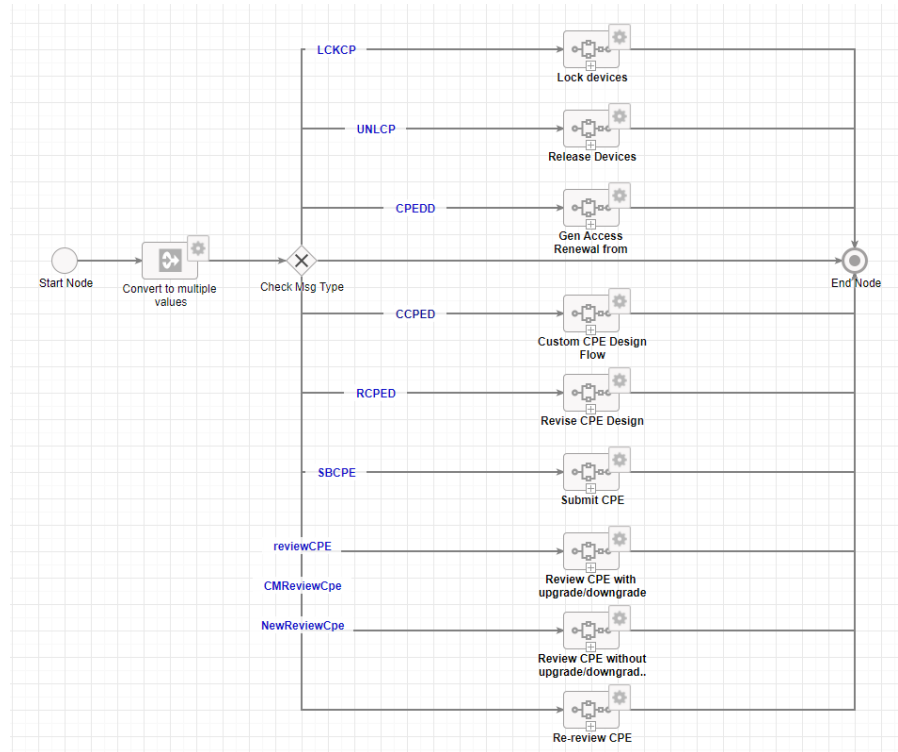
**SOAP Request:**

```
<?xml version='1.0' encoding='UTF-8'>
<soapenv:Envelope xmlns:soapenv='http://schemas.xmlsoap.org/soap/envelope/'>
  <soapenv:Header/>
  <soapenv:Body>
    <pm:start>
      <username>[REDACTED]</username>
      <password>[REDACTED]</password>
      <deviceIds/>
      <msgType>NewReviewCpe</msgType>
      <preQualCriteriaID>27796</preQualCriteriaID>
      <quoteLineAccess>QL00000021402</quoteLineAccess>
      <quoteLineCPE>QL00000027796</quoteLineCPE>
      <quoteLineItemID/>
      <templateIds/>
    </pm:start>
  </soapenv:Body>
</soapenv:Envelope>
```

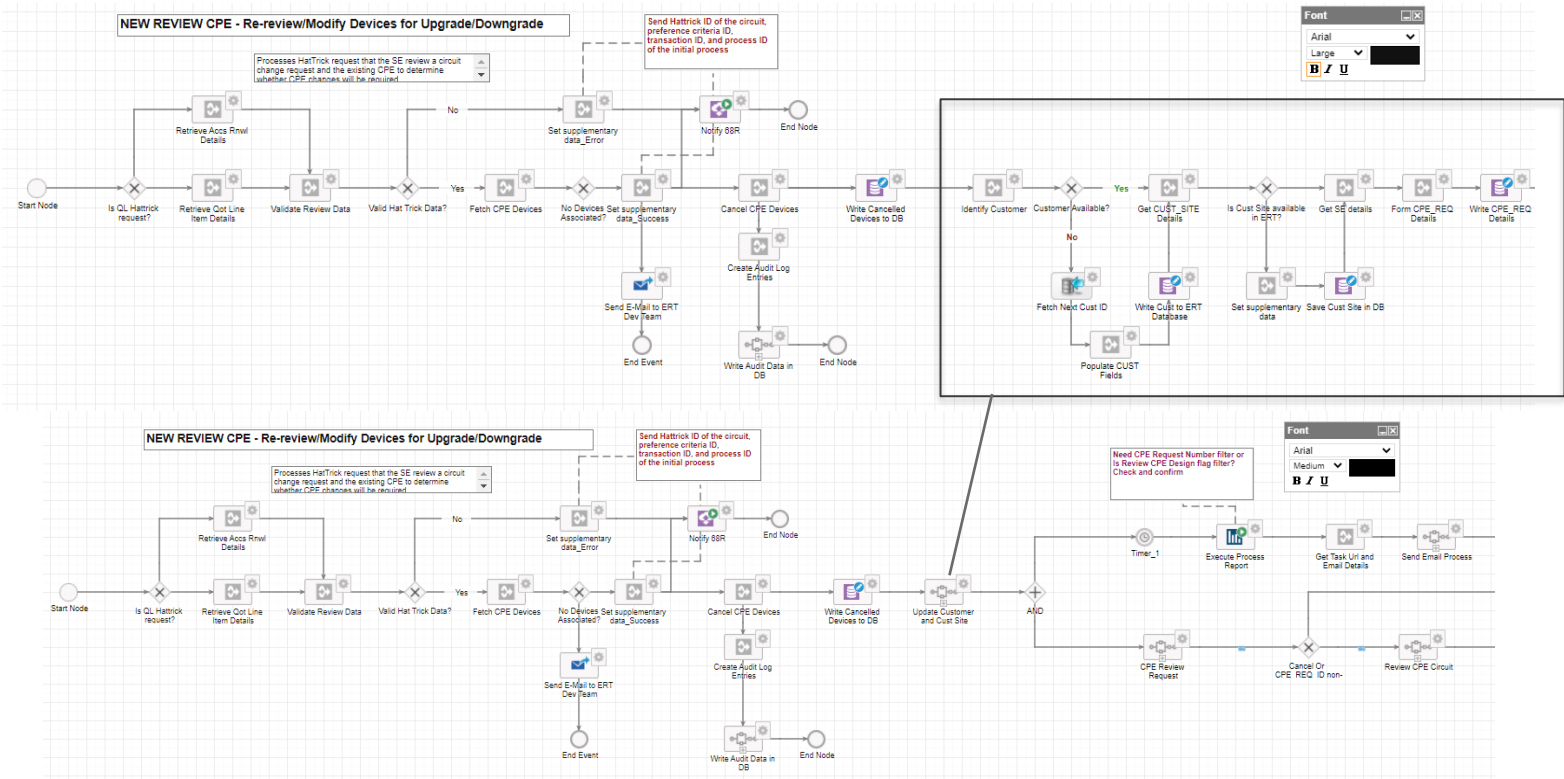
**SOAP Response:**

```
<?xml version='1.0' encoding='UTF-8'>
<SOAP-ENV:Envelope xmlns:SOAP-ENV='http://schemas.xmlsoap.org/soap/envelope/'>
  <SOAP-ENV:Header/>
  <SOAP-ENV:Body>
    <apn:startResponse xmlns:apn='http://appiancorp.com/webservices/pm'>
      <processId>1789923</processId>
    </apn:startResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

# Additional Process Model Branch



# Refactoring & Sub-processes



# Change Request 12

## Handling Orders of Specially Priced Prequal Sites



**Pre-negotiated Access Rates PreQual Information**

WT ID \*  PreQual Name/Description

Customer Name

JSCA ID \*  An optional identifier to help you describe this PreQual.

**Pre-negotiated Access Rates Site Information**

Provide the access rates to be assigned on the H&S.

WT ID: 965231908 JSCA ID: 234123123

Customer Name: ACME Inc

**Sites**

Access Name for New H&S	Address	City	State	Zip Code
	1000 Main St	Houston	TX	77002
	13911 Foster St	Overland Park	KS	66166

**Pre-negotiated Access Rates PreQual Information**

WT ID \*  PreQual Name/Description

Customer Name

JSCA ID \*  An optional identifier to help you describe this PreQual.

**Sites**

States

☒ KS ☐ TX

☐ Select All ☐ Deselect All

Address	City	State	Zip Code
<input type="checkbox"/> 1000 Main St	Houston	TX	77002
<input type="checkbox"/> 13911 Foster St	Overland Park	KS	66166

**Pre-negotiated Access Rates PreQual Submitted**

Your Prequal request for pre-negotiated access rates has been submitted. The system will process your request and send you an email when your Prequal is available.

# Results

- Appian Development, good and bad
- Our code is/will be deployed to production (Filtering, CR14, CR12)
- Never Stop Growing!
  - Communication
  - General Workplace Experience
- Thank you to our recruiter, Eva, for giving us this opportunity
- Thank you to the ERT Team for all the help in learning the trade: Komal, Bonnie, Jen, Tina, Prakash





T-Mobile