

EPE - Copient replacement

- 1) Create a new omni channel experience by replacing the copient promotion engine.
- 2) Replace promotion engine and build a great promotion engine.
- 3) 35 million customers that shop at safeway and 25 million customer we know who are registered.
- 4) Lot of customers have club card or digital coupons.
- 5) "Just for you" has deals and rewards. Rewards are digital coupons and primarily it is for less price on gas or free item while check out.
- 6) 20 million have gone to the app and registered and clip an offer to order to receive the discount.
- 7) The discount is given by copient promotion engine. We need to make sure it works well
- 8) 20% of the time when the customers use rewards for gas they use it for shopping as well. This is the heart of "just for you".
- 9) Customers really value club card but "just for you" gives richer and personalized offers.
- 10) Web services
- 11) Creation of coupons
- 12) Rewards platform
- 13) Clipboard

Promotion engine is connected to inhouse promotion system. Basket transaction while checkout it goes to promotion engine

What the promotion engine responsibility:

- 1) Price point
- 2) offer
- 3) Percentage
- 4) By x and get y
- 5) Expiration data
- 6) Stacking logic - complexity we need to look deeper into

Ex : Two avocado logic and free item

Architecture discussion:

- 1) **Nikhil**: We have to make sure all the dependencies are taken care and moved to other component's to completely move from copient.
- 2) If we want to go in the route of digital wallet then we need to think about rewards and offers. It is a bigger initiative and needs more discussion.
- 3) Customer should be able to see the offers in the digital wallet and we need to define and prioritize what should go in the digital wallet.

Data movement (will need this info for **migration**)

- Central will move data to divisional and which will be used my store POS system
- Publishing will happen via Kafka events

Spike for managing Kafka topics??

Spike- to use HTTP or TCP to move data from Central to store????

Offers Discussion - After break.

Cloud

- 1) The intent is to show the estimated discount is but we will know once entire amount once the transaction is fulfilled
- 2) We need to understand what is "offer" and the metadata for the offer management.
- 3) Offer management is in oms but we need to build a UI for monitoring and debugging.
- 4) There is no "logics" in the new engine
- 5) Two step process:
 - a) Proactive - Alerts creation
 - b) Reactive
 - c) We have a seperate session to define the monitoring.
- 6)

Store:

- 1) The data migration and the services is the same from the cloud except the transaction controller and data store are different in stores and Postgres being used.
- 2) There is spike to use https and tcp to move data from central to store.
- 3) We need to categorize and analyze the store side.
- 4) Limitations in copient it gets set to specific date and time for the store we need to think about centralized cloud.
- 5) Clips are sent to store via multiple clusters. We have a data managed and spark jobs that's how we know which store to send.

Afternoon session: (Laurence) Product manager

Offer Management System:

1. Coupons
 - Manufacturer - Funded and Open like Alberstonsons (NOPA) - Is a contract for the items which are funded and contracted. So based on that the cart checkout it will give us the discount.
 - Store(ABSCO) - Funded and open
1. Coupon:(Meta Data)
 - Exp -----> General Info

- Limits -----> Conditions
- Barcode
- Price
- Restrictions
- Terms

Who:

- In stores
- HouseHold Id

What

- Product
- Department
- Basket

When

- Period
- Day of the week
- Time

Rewards

Montary:

- 1) Free
- 2) Percentage off
- 3) Price point
- 4) Employee percentage

Non Monetary

- 1) Points
- 2) Rebates
- 3) Rewards
- 4) Membership - We need to look at the functionality.
- 5) Box top
- 6) Messaging
- 7) Alaska Miles

Combination of monetary and non monetary falls in SPECIAL BUCKET/Architecure

- Buy X and Get Y
- Accumulation/Continuity

- Meal Deal
- Buy more and save more
- Mix and Match - (EX: Chocolates and Dvds)

2018 offer creation:Promotion

1. MFC
2. PD
3. Just for you(It is also thrown in Weekly ad)
4. CC
5. Wor
6. MFC 9k
 - 1) RV 30k
 - 2) CP 70k
 - 3) SPD 70K

The ecommerce is not using the logic as same as Instore

Some of the online points like instacart points does feed into to just for you.

- 1) Albertsons companies what is an offer is a coupons what criteria and conditions varied in the offer management system.
- 2) **Stacking** logic is complicated needs to be noted
- 3) We need to define the offer in the implementation

Current ecosystem(In production):

1. SC
2. MF
3. PD
4. SP (Non price point)
- 5.

PRMS

QUOTIENT } ---> LEGACY OMS ----> J4U(APP,SITE,EMAIL) , IMAGES,
 EXISTING LEGACY COPIENT, TOGM
 MW TOOL
 SPD

Future Offer Management System:

- NEW OMS -----> Just 4 you(App,Site and Gmail),images, copient --->(legacy redemption engine)
- J4you takes the data meta data from the redemption engine.
- **OMS should be the one stop shop in the future for all the metadata and offer data for the**

promotion engine.

- Nisum has to define the contract and the rules.
- Offer connector is a wrapper on top of copient legacy system for the New oms. (This is not required for the API)

Offer ---> Info → Data and Data ---> Condition -- 1) Store 2) Procedure 3)Points 4) Customer 5) Day 6) Time

Rewards → Points ----> Discounts --Messaging

Customer Journey:

- 1) Item scanned
- 2) Check club price
- 3) Basket completed
- 4) Send net of txn to EPE
- 5) Check the house ID for the coupons
- 6) Check the txn for the eldigble coupons
- 7) Process stacking
- 8) Determine savings
- 9) Return to POS

Conditions:

- 1)Store → Store groups
- 2) Product → Product groups
- 3) Point → Point groups
- 4) Customer → Customer groups → Instant win,Alaska Qmiles, GRD
- 5) Day →

Nisum needs to receive the condition document from Lauren

Parking Lot:

- 1) UI - Feedback and page to view is nice to have for monitoring(If the offer has reached).
- 2) IPL (Rebuild postgre and servers)
- 3) CMS will move to Just for you but not now.
- 4) Support membership grouping
- 5) Messaging monopoly, scorecard
- 6) Group Changed impacting offers
- 7) Feedback for the offers flowing from OMS

Vijay Maddu Session Rewards 12/5

- Printed coupons :conditions
 - Trigger codes, PLU/Bar codes
- Attribute conditions
 - How offer structure will be created to support how attribute conditions will be supported for Alaska and instant wing?
- ***We need to build parity because it needs to interface with redemption engine
- Store Group Id: send offer to all associated stores
- Trickle offers to specific terminals - offers can be terminal specific

Reward Systems

- Meal Deal
 - Combo offers - buy a all items to get a deal
 - What are the conditions for the offer types we need to dig deep dive for example the meal deal and prorating.
 - How the discount allocation work for the multiple meal deals and bundles?
(Safeway product team to get back after review with business)
 -
- Discounts
 - Price point offer
 - Fixed amt
 - Fixed price
- We need to define how we define the three attributes above for the new EPE.
- Notifications:(Ex. Monopoly game starting from a certain being printed on the receipt)
- 1) Printed message
- 2) Cashier message
- We have to solve this functionality without breaking it for the POS.
- Two JSON structures:
 - 1) Copient Offer structure(Understanding the redemption engine)
- We need to understand the current copient contract and understand from our end(Nisum) the dependencies.

Offer types:

- 1) Clip and click -> Digital and store
- 2) Digital coupons → Digital
- Instore → Store coupons
- Point only → Store

Workflow of an offer:

Offer creation I/D → Approve(Actions) → Redemption,Just for you and Images (Scan)(active goes by date and approve goes by status.) D - this is mostly for j4you and it is basically when we have enough clips. E - Deactivate and expired states

Groups copient and redemption engine:(Offer management)

- Product creation → UPC,promotion UPC,dept, manufacture code (For example: Coke 100 UPC the vendor gives safeway),PLU (Is used To create a promotion at store). (Get the list of items not product)
- Functionality is needed and Safeway technology team needs to discuss.
- Point
- Technical challenge: If there 300 k products how do they redownload and publish again?
- We need to align on how we are going to send the data in http or offer domain object.

Clipping:

- Changes happening in january just for you sends the id's to copient engine thats how the offers are clipped.
- Clipping is not available online -
- Clipping(There is not unclipping from copient point of view):
 - 1) Store coupon
 - 2) Manufacture
 - 3) Division
 - 4) Just for you
- Paper clips:
 - 1) Paper clips PLU will only be shown in paper clip but it does not go to

Just for you.

- 2) Range's for PLU and offer codes. (7 series
- 3) Trigger codes(Once scan is enough): It is for manufactured coupons.(Example for pepsi if the limit is 5 then scan once from the paper click)

What is the downstream usage of the PLU disqualifier?

What are the use cases for store exclusions?

What are the use cases for customer exclusions?

How is membership used? What is the difference with customer group? (analytics)

Should we enable Instant Win functionality for the future? (legal risk?)

12/5

What is the difference between a PLU and Trigger Code?

Alaska Airline or Instant Win - attribute...why can't we use another way?

How does the cutover from old to new work when we fix the hacks? what are the hacks we plan to fix?

Meal Deal is 3 offers to handle "1"

Is the combo meal upsell part of Copient?

What is the library of offers that divisions use?

How does discount allocation work for meal deals? (must buy multiple items)

Ecrebo - what messaging with it handle going forward? (general messages? Point messages? Other business messages? Monopoly is an example using notification setting (is this setup as a no condition offer?)

How does limit off work in the Discount section?

What is the impact to report when we expire an offer? (Michael Regrave) How do we account for changing the date?

Schema design: (continuation from Thursday afternoon to Friday)

- 1) There is no unique code for the customers there is only household ID. The coupons are by one per customer based on household ID.
- 2) Discount has a limit(Promotion engine logic) and offer has a limit (Usage limit)
- 3) This is just for you and this is just keeping the count and updating the count there is no HHID or tracking for paperclips.
- 4) How do we convert 80% users from paperclips to digital coupons(Product managers to sync up on strategy)
- 5) Ram: We need to add more attributes in the tables.
- 6) Clips lookup table: 300,000 stores.
- 7) How to inject all the data from the tables to the stores.
- 8) Ram: Use All customers and all logic rather then expanding the data in the tables.
- 9) Krishna: Let us look up this logic and see if it works in the table.
- 10) Ignite primer: Ignite supports partition tolerance and enhanced KV pairs and we can add Sql on top of it.
- 11) Is Cassandra needed? Ignite may not fit in stores so we may need it. What are our infra needs?
- 12) POCs on Sparc and Python/Java/Scala?

Dec 9th

Is void/post void supported in VPOS?

When is end-of transaction considered?

When is POS system being replaced by Toshiba POS? Will Toshiba checkout send the entire transaction or individual scans?

Transaction adapter is a stop-gap to maintain state-logic until replaced with Toshiba.
Not in scope for Nisum, will be done by Safeway team.

*****We need a record of transaction at POS level at per scan level - how many points are accumulated - moved to parking lot!!!

Ram: We need to store after the transaction is completed at pos level not when the transaction is loaded. (Need to check with Toshiba on this)

Kalyan: Ram to define in Jira the technical stories and spikes and dependencies based on today's conversation with Kalyan's notes in confluence. This will give an estimation of work or scope to be done.

We need to apply for the order process.

Offer transaction services:

- 1) Item data - Input like (UPC)
- 2) Points data
- 3) Offer data - Clips

Get the clips

Offer promoted to the services and called back when called.

Store Services

Offer Transaction Services

- Redemption Endpoint
- Given Storeid/UPC - give a list of all active offers (take time zone difference in account for 'active' offers)
- Given Storeid/HHID - give a list of all clips, list of usage limits

Find all XS Stores

- Find clips per transaction stores
- Find offer usage limit per transaction store

Identify all read models for a transaction - Kalyan needs help to finish this by Ram.

The current reports from copient will be moved to other systems

1What are the reporting needs?

December 10th

Spike : Can PMS give us range of UPCs instead of a list to help with the amount of data coming in and compressing the data? Check with Krishna

12/12 :Krishna : It may not be possible to do it in this manner. Need to work with Vijay and Sarath to come up with solution for HTTP chunking or other options. A general solution for how to send large amount of data.

Spike: How does offer meta-data changes gets propagated? How does offer lookup changes get propagated?

Spike: OMS publish to offers topic->Sparc job writes to Cassandra tables->Sparc job to read from Cassandra table-> Transform data (Transpose UPCs) -> Write to Ignite->Write to Division Kafka

Spike: All stores expanded list from OMS or from EPE

ERUMS today has a primitive promo engine which needs to be replaced with central EPE - dependency****

Offer redemption

Item level

Retrieval : any store, any terminal, any customer, any UPC

Given store, given

Joins with clip offer, offer metadata, offer lookup, usage limit

Offer Clipping

Follow up with Himnashu Kapse for EDIS

J4U team : to include store id in clips

Clip redemption - clipped from gallery implies rewards are already claimed

Clip claiming - the offer created from the clip is redeemed at POS/online

Fuel Rewards

Partner and Safeway stations - Rewards management system will handle all the discounts. These are not in scope for EPE - talk to NITIN - product scope needed as well - should be in scope for Rewards Hub

Points program - like Alaska airlines - are they in scope for EPE?

The management of fuel or airline rewards will be managed by Rewards Hub (new func)

- Is EPE responsible for fuel discount - EPE as is
- Is EPE responsible for points at offer level - rewards team will take care of it
- Do we have a local store rewards service for points data - open question. depends on rewards architecture if there will be a local rewards component (does store infra support it) - EPE to call a service and will be agnostic of local or

central

- What is the contract from rewards to send points per transaction in real time? - Parking Lot Meeting with Nitin, Kalyan, Vish (Rewards)
 - New data model to track rewards history
 - Rewards needs data at item and Tx level to store data at rewards hub
 - Is post-void a valid use case?
- Rewards system to publish rewards clips to EPE topic
- Can there be points awarded for transaction level and dept level discount? If yes, what is the pro-ration logic?
- What is scorecard?
 - Overall rewards and point balance and how many points will expire per HHID
 - EPE will use the rewards balance to use just-in-time burn???
- Reporting on points accumulated and redeemed by transaction - will be done by rewards. OOS for EPE
- How long should we keep the transaction data?

December 12

DevOps

- Are we in PCF for now and then moving to AKS
- AKS will not be ready for another 4-5 months
- Ignite cluster have to be built as active-active
- Phanivas - infra partner to help with
- We will need CI/CD pipeline to be built
- How do we run this in production?
- Out of Scope - we will not test anything in Stores
- Performance testing on clippings and EPE
 - Setup a store
 - Scripts to generate offers and scripts
 - Response times, failures,
 - NFRs - volume of transactions
- Partition re-balance
- Archival

December 16:

With Jonathan

- If EPE does the totals, there will be hard dependency on making changes to 4690 controller. As 4690 is stateful, and if EPE is stateless - POS is stateful and sends the voids and does not send overrides.
- so who will maintain the state?
- Eg: Messages are sent to POS in foll manner

- Item1 \$1:00 10%off coupon
 - Item linkcode -> -0.10
 - Item -> -0.10 (void)
 - ->0.05 (sent)
- So the transaction adapter should maintain the state and voids and finally do the overrides on 'totals' and not End of Transaction
- POS is doing the totals today. Toshiba's POS has a new module called 'Clean Receipts' which cleans all the voided transactions.
- Transaction adapter to send void messages to POS in case of change in discounts which is required for our current deployment strategy of EPE and CPE(Copient)
- What will take to roll off CPE
 - We have performance captured that means the response from EPE is faster than CPE - how do we measure this?
 - Exact same discounts are available at POS from CPE and EPE
- Do we have TxAdapter at Central? Is there a need for it? How does state gets maintained by Cart API (ERUMS)
- Out Of Scope : Integration with ERUMS for Transaction ID

Monitoring - Ian Rocket

Deployment Strategy should be on containers

Spike: Store Infra needs for CPU,RAM, HDD for EPE

How often do stores go offline?

- What are the Store Infra team needs from Application team for bringing up a new store?
 - Needs server config, VMs for the store, Cluster config
 - Needs for Radia (??)
 - Needs on deployment for DevOps to push it to Radia. What is SOP (Std. Op. Proc).
- What happens if there is a hardware failure in store
 - Team swaps out failed parts
 - Team working on better working models
 - What are the SLA's - 4 hour recovery
- Copient systems footprint is small and can be rebuilt easily in the store
- There are only 3 hosts per store - there is a plan to expand that so we should tell them what we need to scale.
- POS Infra and Field services team does IPL (??)
 - Process to kick off new store or hardware failure
 - Take info about products and pricing from a similar store and uses for new store or restoring a store
- What port opening are needed for Stores for Cloud

- Application owners submit a RIT to Infosec team and they take about a month to apply changes by network team.
- Security certificates
 - Who issues? Who applies? Who renews them? - Ian to give names
 - There is a team Infra App - which applies the certificates in the store
 - Submit a RIT
 - Requirement - HTTPS
- TOAST - Application Support Team

Monitoring Team - ESM Team

- Do we build our own monitoring?
- System level is available but not transaction level.
- AppDynamics for application level monitoring
- Alerts for TxAdapter
- Logging
- POS error handling
- Error handling and retry mechanism
- How is POS Transaction Id generated and persisted? How is it sent to EPE?
- Scenarios around Default HHID??? - Laurence Wong
-

Deployment for testing POS messaging

- Web Tool by Jonathan for internal system
- There is a Lab in Livermore
- There is no way for terminal level deployment. It has to be at store level

Receipt Messages

- Copient Offers are printed at end of the receipts
- So EPE will send these messages
- Survey offers - created by Logix UI and comes to EPE as regular offer
- Continuity offers
-

Use cases -

- Test offer - pre-creation (OMS)
- Preview offer
- Production offer
- Offer create
- Offer updates
- Offer deletes (TTL/status changes)
- Enable CDC (Change Data Capture) on Offers

- Read Active/Approved Offers - restore or recover data for failures
- offer expired, deactivated - forceful expiration, organic expiration
- Offer changes - customer group changes, product group changes
- Offer override at POS? - not needed for us
- Offer used at POS
- Offer used online
- Offer lookup
- Offer clips
- Offer price with club card, without club card
- Offer updates - metadata - rarely updated
- Offer application/usage at various level - item, cart level, basket level, product level
- Restore offer data on failures at a store level / group of stores/ division level /by offerId
- How do you restore a brand new store?
- Delete Clips - unclip by customers
 - Today if you clip, you are burning rewards, use it or lose it
 - So there is a need in future to allow **unclipping**
- Clipping offers to claim rewards - integration with Rewards mgmt system
- Instacart does not have HHID but we offer rewards
- Tender based points - uPay(new feature, in Beta) based
 - Connected to bank account, so credit card transaction fee is saved
 - It will come as offer to EPE which can be redeemed
- Earn points
 - Are points awarded after offers are applied?
- Burn rewards
 - GR rewards are pre-authorized
 - Burn is not in scope today for EPE
 - Need for future to track burn
- Earn/Burn rewards/points
 - EPE will send points earned at each Tx level for each item with the offerId. Rewards system will figure the claimed offers/rewards based on that and add any new rewards for HHID
 - Multiple offer types can be combined if they are different offer types
 -
- Use cases on stacking logic
 - Same reward (free) from rewards and club card offer
 -
- SLA's for offers to reach the store (clip time)
 - Today it is 30 secs for clips to reach store
 - Should be near real-time

- Hardware failures at store
- Sprouting a new store
- Scenarios around Default HHID???
- Deployment strategy for stores - should be automated
 - Today it is manual and done by AST team

Still to be talked about:

Monitoring

Logging

Deployment

Testing

Performance Testing

Data replication

Lag metrics

Store ecosystem

Reporting

Action Items from Safeway (Laurence's actions items):

Moved to Confluence -

<https://confluence.safeway.com/display/EPE/Open+Item+Tracker>

- 1) To receive the business requirements from each product where the dependencies and technical aspects.
- 2) The entire business requirements from offer types, rewards or any technical items we need to receive to define the scope of the entire project and pricing.
- 3) What is the impact to report when the offer expires?
- 4) Where the offer can not be further edited.
- 5) The item coming from POS will it have a department ID in the UPC?
- 6) Technical dependencies needs to be solved from business like UPC's etc.
- 7) Customer grouping and Product grouping is a big task and need lot of discussion.
- 8) When there is a paper coupon multi use and they scan the paper coupon and they scan it again can they waive the multi use or they have to come back with the paper again.
- 9) Need more real example of compute discount

Action Items from Nisum:

- 1) Before entering execution we need to define what in detailed scope featuring the business requirements.
- 2) Epics need to be defined and consolidated with product
- 3) Kalyan: Epic: Offer management system spikes(How do we get the data, what if we increase the size of kafka message and configuration) and list down the technical discussions) Ram to open these in Jira. (Dec 10th)
- 4) Kalyan: Ram to define in Jira the technical stories and spikes and dependencies based on today's conversation with Kalyan's notes in confluence. This will give an estimation of work or scope to be done.(Dec 9th)
- 5)