Fiscal year rollover

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JIRA task	
Business Requirements	👤 **UXPROD-772** - Rollover Encumbrances into the next Fiscal Year DRAFT
Architects Review	
PO review	

Revision History

Version	Date	Owner	Description	Reason
v1.0	07.27.2020	Andrei Makaranka	Initial version	
v1.1	07.31.2020	Andrei Makaranka	Fill gaps	Grooming session 29.07.2020
v1.2	08.01.2020	Andrei Makaranka	Design writing started. Activity diagram added	Internal grooming session 08.07.2020
v1.3	09.25.2020	Andrei Makaranka	Update model and API definition	

Overview

 In order to start the next fiscal year the user must be able to transfer or close outstanding encumbrances for orders that have not yet been resolved. This is generally done based on order type.

Use cases:

- Library has ongoing orders that must be re-encumbered in the upcoming fiscal year. The library will want to encumber money next year based on what was spent in the current year and potentially increase it by a specific percentage.
- Library has ongoing orders that must be re-encumbered in the upcoming fiscal year. The library will want to encumber money differently for continuations that for subscription orders. Increasing them by different percentages.
- Library has one-time orders that could not be close and must be re-encumbered in the upcoming fiscal year. The method of encumbrance may differ from that of on-going orders. For one-time orders the library would rollover remaining encumbrances.

High-Level Requirements:

- Adjust the date of encumbrances without affecting monies that have already been expended against this encumbrance
- **Release encumbrances without affecting the monies that have already been expended**
- Capture the original amount encumbered based on the purchase order line
- Track the amount expended against this encumbrance
- Track the current encumbrance
- Note the currency?
- Note the exchange rate if applicable?

Constraints

- The fund must contain only one active budget.

Assumptions, dependencies

- API for changing and creating a budget is ready.
- API for changing, creating and releasing encumbrances is ready.
- API for re-encumbered is ready. (Confirmed by Dennis Bridges on grooming 29.07.2020)
- It is likely that we will be creating upwards of 75000 - 100000 encumbrances during this process. (statistics from Library)

Out of Scope

- Automatically trying to resolve issues which occurred in rollover time.

Architecturally Significant Requirements

- Fiscal year rollover is a process which must happen for all ledgers separately and this process started manually by user.
- Ledger rollover includes : Budgets rollover and encumbrances rollover and those rollovers are independent processes.
- The system after rollover must be in a consistent state. All budgets and encumbrances must be processed and as result rollover end successfully or with errors.
- An error report will be generated after the process completes.
- Must be compatible with PostgreSQL 10.x

Solution Design

Rollover flows

Fiscal year rollover flows

Data Model

ledger_fiscal_year_rollover

Property	Type	Default	Required	Notes
id	string		N	UUID - System generated if not specified
ledgerId	string		Y	
fromFisclaYearId	string		Y	UUID of the fiscal year from which rollover will be happened
toFisclaYearId	string		Y	UUID of the fiscal year to which rollover will be happened
restrictEncumbrance	boolean	false	Y	If true, imposes restrictions on encumbrances
restrictExpenditures	boolean	false	Y	If true, imposes restrictions on payments
budgetsRollover	array<budgets_rollover>		Y	
encumbrancesRollover	array<encumbrances_rollover>		Y	
ledgerRolloverStatus	ledger_fiscal_year_rollover_status		N	Collecting rollover progress information
metadata	metadata	Generated by system	No	System generated record metadata

budgets_rollover

Property	Type	Default	Required	Notes
fundTypeId	string		Y	UUID - UUID from fund_type table
rollover_allocation	boolean	true	Y	Should allocated amount needs to be rollovered
adjust_allocation	number	0%	Y	How much should we increase the allocation
rollover_available	boolean	true	Y	Should available amount needs to be rollovered
add_available_to	enum	Available	Y	Where to add available : Available or Allocation
allowableEncumbrance	number	100%	Y	The encumbrance percentage limit for this budget

allowableExpenditure	number	100%	Y	The expenditure percentage limit for this budget

encumbrances_rollover

Property	Type	Default	Required	Notes
orderType	enum		Y	Ongoing, Ongoing-Subscription, One-time
basedOn	enum		Y	Expended, Remaining
increaseBy	number	0%	Y	How much should we increase the encumbrance amount based on "basedOn"

ledger_fiscal_year_rollover_status

Property	Type	Default	Required	Notes
id	string		N	UUID - System generated if not specified
rollover_id	string		Y	UUID - Ledger rollover id
overall_status	overall_rollover_status	Not Started	Y	Status of the rollover process : Not Started, In Progress, Error, Success
budgets_rollover_status	steps_rollover_status	Not Started	Y	Status of budgets rollover process : Not Started, In Progress, Error, Success
encumbrances_rollover_status	steps_rollover_status	Not Started	Y	Status of encumbrances rollover process : Not Started, In Progress, Error, Success
orders_rollover_status	steps_rollover_status	Not Started	Y	Status of orders rollover process : Not Started, In Progress, Error, Success

APIs

Rollover Business API

Method	Path	Request	Response	Description	Interface	Notes
POST	/finance/ledgers/{id}/rollover	ledger_fiscal_year_rollover	ledger_fiscal_year_rollover	Create and start process ledger fiscal year rollover	finance.ledgers.rollover	Status : 201
GET	/finance/ledgers/{id}/rollover	NA	ledger_fiscal_year_rollover	GET ledger fiscal year rollover	finance.ledgers.rollover	Status : 200

Rollover Storage API

Method	Path	Request	Response	Description	Interface	Notes
POST	/finance-storage/ledgers/{id}/rollover	ledger_fiscal_year_rollover	ledger_fiscal_year_rollover	Create and start process ledger fiscal year rollover	finance-storage.ledgers.rollover	Status : 201
GET	/finance-storage/ledgers/{id}/rollover	NA	ledger_fiscal_year_rollover	GET ledger fiscal year rollover	finance-storage.ledgers.rollover	Status : 200
PUT	/finance-storage/ledgers/{id}/rollover	ledger_fiscal_year_rollover	NA	UPDATE ledger fiscal year rollover if it not started or end. Also	finance-storage.ledgers.rollover	Status : 204
DELETE	/finance-storage/ledgers/{id}/rollover	NA	NA	DELETE ledger fiscal year rollover	finance-storage.ledgers.rollover	Status : 204

Rollover progress business API

Method	Path	Request	Response	Description	Interface	Notes
POST	/finance/ledgers/{id}/rollover/status	ledger_fiscal_year_rollover_status	ledger_fiscal_year_rollover_status	Create rollover process	finance.ledgers.rollover.status	Status : 201
GET	/finance/ledgers/{id}/rollover/status	NA	ledger_fiscal_year_rollover_status	GET rollover process	finance.ledgers.rollover.status	Status : 200
PUT	/finance/ledgers/{id}/rollover/status	ledger_fiscal_year_rollover_status	NA	UPDATE rollover process	finance.ledgers.rollover.status	Status : 204

Rollover progress storage API

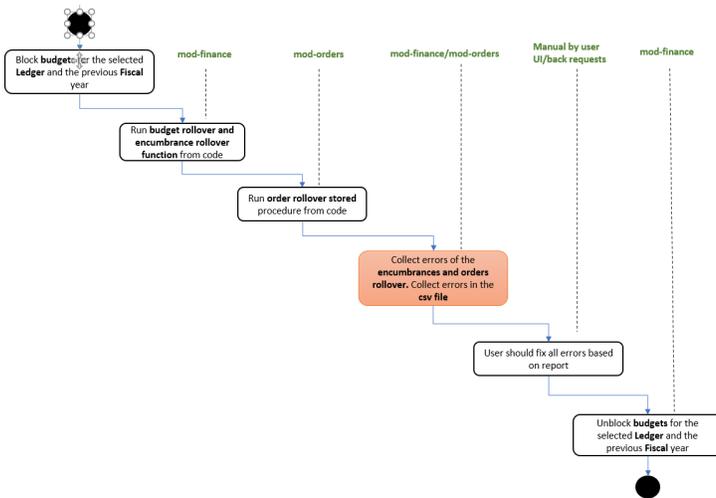| Method	Path	Request	Response	Description	Interface	Notes
POST	/finance-storage/ledgers/{id} /rollover/status	ledger_fiscal_year_rollove r_status	ledger_fiscal_year_rollove r_status	Create rollover process	finance-storage.ledgers. rollover.status	Status : 201
GET	/finance-storage/ledgers/{id} /rollover/status	NA	ledger_fiscal_year_rollove r_status	GET rollover process	finance-storage.ledgers. rollover.status	Status : 200
PUT	/finance-storage/ledgers/{id} /rollover/status	ledger_fiscal_year_rollove r_status	NA	UPDATE rollover process	finance-storage.ledgers. rollover.status	Status : 204
DELETE	/finance-storage/ledgers/{id} /rollover/status	NA	NA	DELETE rollover process	finance-storage.ledgers. rollover.status	Status : 204

Design

Solution will be based on stored procedures in PostgreSQL and this is followed from 3d item from "Architecturally Significant Requirements".

The following PostgreSQL procedures are required :

1. Budget rollover procedure
2. Encumbrances rollover procedure
3. Change cost in the processed orders

Stages and sequence of execution fiscal year rollover:

Open Items

Question	Answer
Andrei Makaranka : How many users can start rollover at the same time?	Dennis Bridges Each ledger could rollover independently but most would roll one at a time. Generally there is one user that handles the rollover at each institution. However, for a multi library instance each Ledger could be rolled over by a different user.
Andrei Makaranka: Could you clarify what "unfinished orders" are and what encumbrances should we choose for a rollover?	Dennis Bridges Any "Open" orders should be considered in the rollover. However, some may not have encumbrances. Closed and pending orders will not need encumbrances created during rollover for the new fiscal year.

Andrei Makaranka: There are to approaches how to rollover budgets: 1. After the start of the rollover all selected active budgets will be **blocked(Status = "Closed")** for any operations and then all new budgets start to be created. 2. After the start of the rollover, the budgets are **blocked(Status = "Closed")** and new ones are created for them one by one. Example : Block first budget and then create new budget. Block second budget and then create new budget. *What is the right approach from business view?*	Dennis Bridges This process is generally done while all other system activity is frozen. Meaning the expectation would be that if I am rolling over Ledger A no one can spend money against any of the budgets assigned to Ledger A. Option 1 seems like the appropriate approach.
Andrei Makaranka: Do we need set "Active" status for new budgets immediately after creation or only when rollover will be finished?	Dennis Bridges So long as the system can still create the necessary encumbrances I believe we should activate the budget last. So the users can be sure no one is able to order or invoice against them during rollover.
Andrei Makaranka: We need set of checks which we can use for building error report. Also it's needed for estimating the scope an effort what we need for implementing a rollover check process. *Could you please provide this set of checks?*	Dennis Bridges The checks would include: Were budgets closed successfully for previous fiscal year? Were budgets created successfully for new fiscal year? Were budgets activated successfully for new fiscal year? **Note: if Fund status is Frozen, then new budget should be created in status Frozen.** Were allocations created against all new budgets successfully for new fiscal year? Were encumbrances created for all POLs against new budgets for new fiscal year?
Andrei Makaranka: Library will want to release all remaining encumbrances in the fiscal year that is being closed?	Dennis Bridges No, I have confirmed that the encumbrances should remain as they are in the fiscal year being closed, for reporting purposes.
Andrei Makaranka: What field need to be included in the error report?	Dennis Bridges **Order error table** POL Number (Hyperlink) Failed action(s) (Eg. Create Encumbrance) Amount (Eg. $104.03) Fund Code (Eg. ECON) (Hyperlink) Error message (Eg. Not enough money available in the Fund to create encumbrance) **Fund error table** Fund Code (Hyperlink) Failed action(s) (Eg. Create allocation) Amount (Eg. $1000) Error message (Eg. System error: server could not be reached)

Aliaksandr Pautau : *What should happen to invoices during a rollover, specifically with Pending payments?*	Dennis Bridges : Any invoice with a pending payment that IS NOT in the workflow state "Approved" should be moved into the next fiscal year (**Note:** Currently this is not an issue, but we will be implementing a feature in the future that will mean creating pending payments for all invoices that are Open). Any invoice with pending payment(s) that are in the workflow state "Approved" should NOT rollover pending payments into the next fiscal year. **Important:** Also, any payment or credit for the invoice should be created for the FY during which the invoice was approved. • Eg. Invoice 1234 is approved in FY2020. The ledger is rolled over into FY2021 and then the invoice is transitioned to paid. Payments are created for FY2020 budget.
Andrei Makaranka In what order should we process orders during rollover? Example: 1. We can start from the very first in time to the last created order. 2. We can start with the orders with the least encumbered amount of money booked or vice versa.	Dennis Bridges We will start from the oldest orders and finish with the newest orders.
Andrei Makaranka Is not clear how to create new fiscal year rollover? In mockup https://drive.google.com/drive/u/0/folders/1OGnJNiNVgm6c6qifjDf-ZXnAhlv54JTV • FY20 - Is this the fiscal year code? If yes why the use can't edit the code?	Dennis Bridges Mockup has been updated so the user will not need to edit the Fiscal year at this time. They can select an existing year or create a new one during rollover. https://drive.google.com/file/d/15i9H9JM6Tk6DDv9M2ubkzincxN4xep2t/view?usp=sharing
Andrei Makaranka Is not clear how to change costs in mixed POL? How to split percentage between different types physical and e-resource?	Dennis Bridges We are not really concern with cost being updated it might be ideal not to update the cost. Particularly when basing the increase on amount expended which could be higher OR lower than current cost of POL. We may need to discuss what mechanism could be added to handle these changes. I have often times considered that it could make sense to have a Cost FY for the POL so an order can have a clear cost history from one year to the next. I have created a visual to describe use cases and help us discuss the solution. FYRO Encumbrance visual.pdf
Aliaksandr Pautau In case of an error of lack of money in the fund: Should we skip the creation all encumbrances for the order, or only for a fund where there is no money?	Dennis Bridges In this case the order should be skipped. Essentially it should appear in the error report after rollover as having failed because the encumbrances could not be made. Because there was not enough money available in FUND XYZ
Andrei Makaranka How to be in a situation if in the same POL we have funds from different ledgers and then the cost changing affects the ledger who did not rollover?	Dennis Bridges In this case the order should be skipped as well. Essentially it should appear in the error report after rollover as having failed because the encumbrances could not be made. Because there was not enough money available in FUND XYZ. Ideally IF the other ledger was rolled over already, at which time this order failed to encumber. Then rolling over this ledger would make another attempt and this time it would be successful encumbering both funds as they would now have allocations. So again either the order is entirely successful or not and if not it is flagged for the user in the report.
Andrei Makaranka Should user has specific permissions for starting rollover? (the similar like we done for approve order)	Dennis Bridges Yes, note the permission reference in UIF-168. **"Finance: Execute fiscal year rollover" permission.**