Practical customizations in Blackbaud CRM

blackbaud®
DEVELOPERS' CONFERENCE
June 15–17, 2021

BLACKBAUD CRM™ TRACK

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Session Host: Jim Ballou

Safe Harbor Statement

This presentation contains forward-looking statements that involve inherent risks, uncertainties and assumptions. It outlines Blackbaud's current plans and general product direction as of the date this presentation was created. Functionality described in this presentation that is not currently available is subject to change at any time, without notice, at Blackbaud's sole discretion. It does not represent a commitment to develop or release specific features within the timeframe discussed, according to the presented design, or at all. Please make any purchase decisions based on features and functionality that are currently available.

Customization of Blackbaud Solutions

As a Blackbaud customer, your Authorized Support Contacts retain the responsibility for providing internal support for Customizations of your Blackbaud solutions by:

- Providing direct support to answer questions regarding Subscription functionality, internal business practices, and troubleshooting processes to Your Non-Authorized Users
- Providing direct support to answer questions regarding Customization specifications, features, intended usage, and Error correction and troubleshooting processes to Your Non-Authorized Users

Providence St. Joseph Health

- Blackbaud CRM since 2019
- 5 rolling go-lives June 2019 to Feb 2021
- 30 separate databases converted to one CRM
- 39 local foundations plus regional and system levels
- Mix of full-service, large market hospitals, local rural hospitals, hospice facilities, research foundation, and future conversion of university and high school

Why do we do this?

- Usability and Efficiency
  - Added/improved functionality
- Standardization and Consistency
  - Everyone counts things the same way
  - Create a data presentation layer
  - Create self-serve data
    - Raw/calculated/compiled data readily available rather than via query/export

Why continued…

- But also site structure and the number of entities we support
  - We work hard for a balance of
    - Keeping all teams on the same page with workflow, code table usage etc.
    - But also maintaining flexibility between large and small shops, hospitals vs hospice etc.
  - Standard reporting and analysis methodology at system, region and local level

How?

- Protect your developer(s)
- Training and Helpdesk
- Kanban Board
  - Business value
  - Level of effort
  - Quick wins to build trust and adoption
- Weekly Sprints

#bbdevdays

Add Revenue Recognition Credits Customization

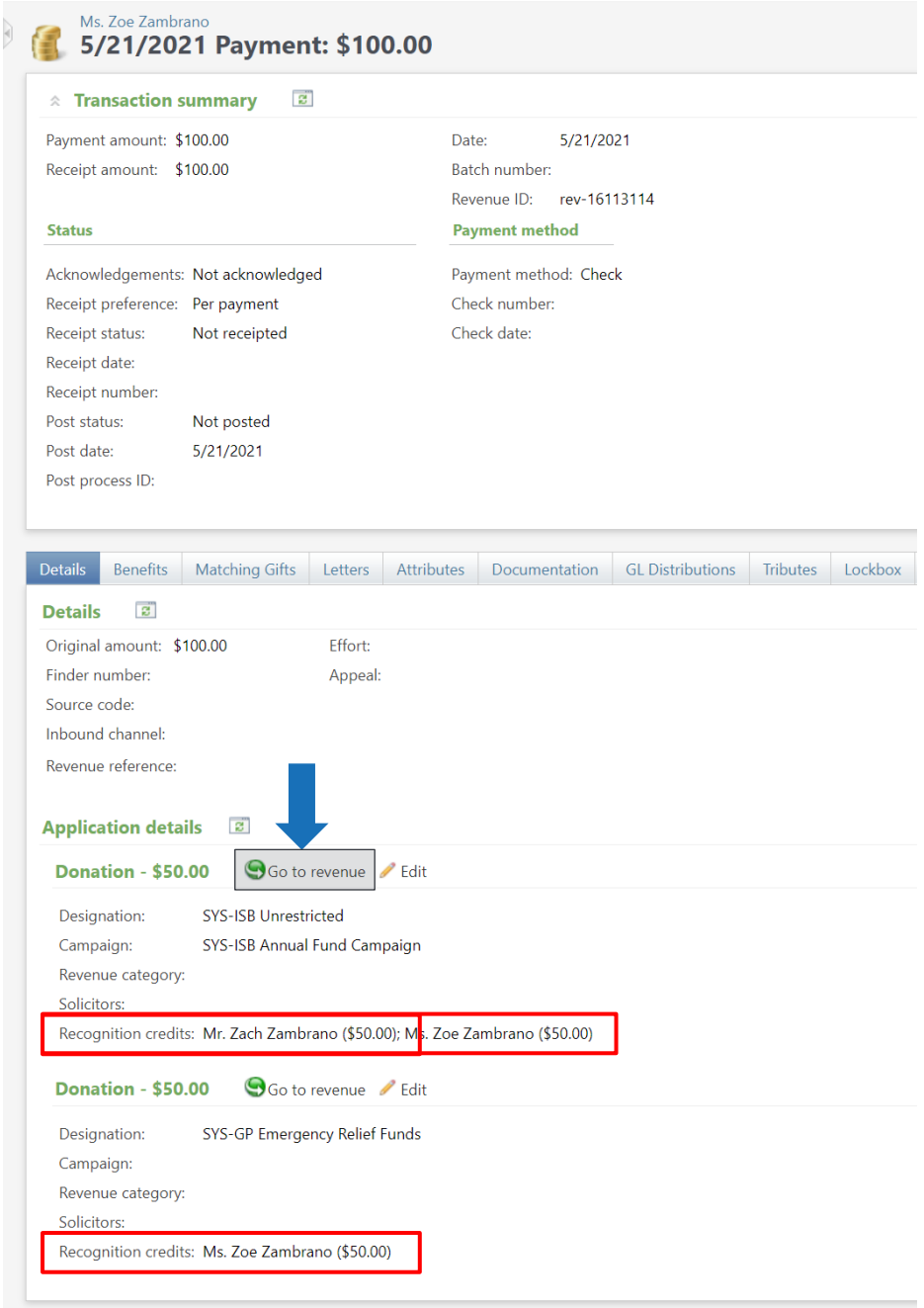
A CASE STUDY IN UTILIZING THE INFINITY SDK

Add Revenue Recognition Credits

Business Problem

Adding revenue recognition credit for past donations is labor intensive, as a recognition credit must be manually added for each revenue application.

The need to add credits for past giving occurs when adding new spouse, family foundation or privately owned business records.



Add Revenue Recognition Credits

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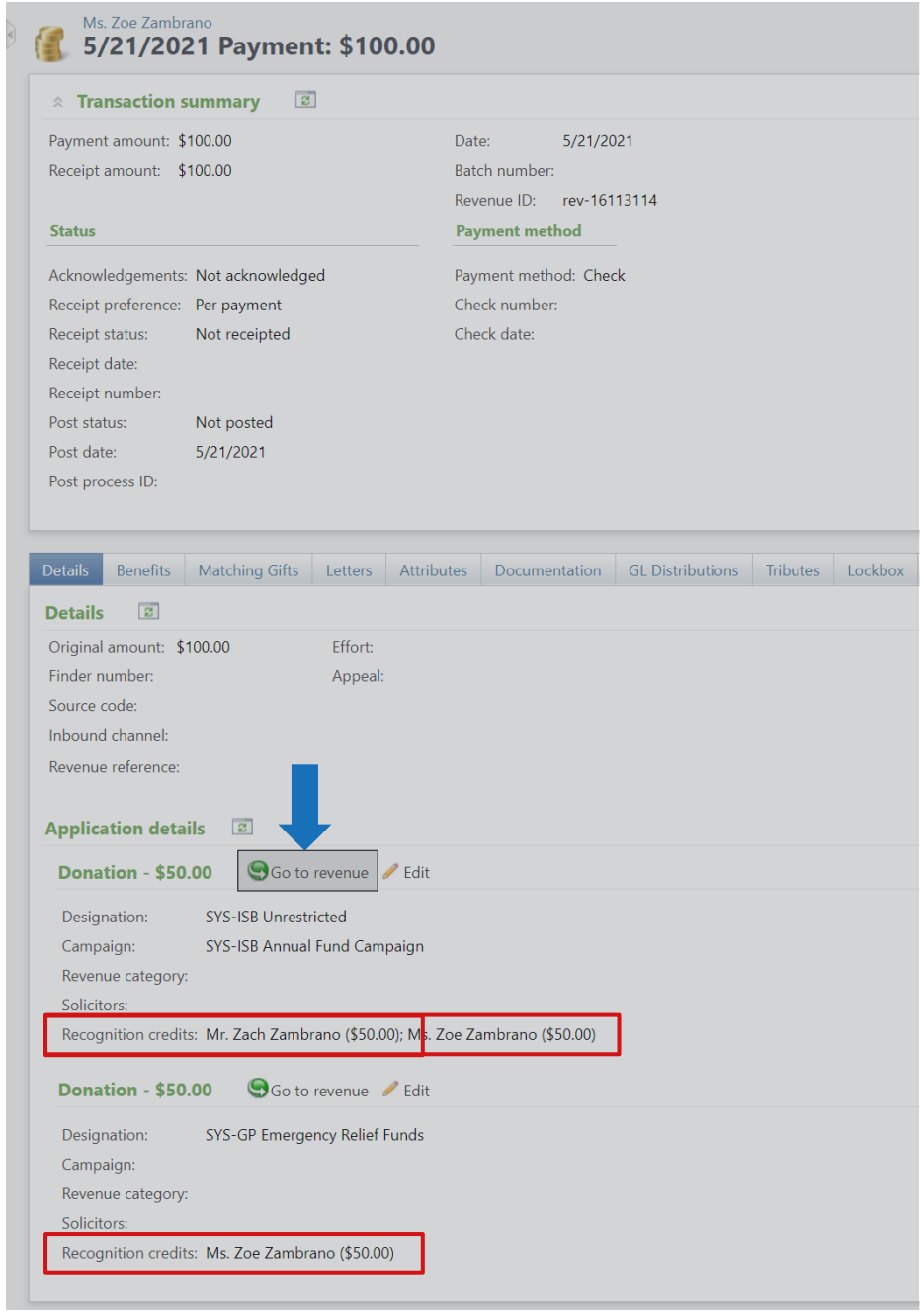

Add Revenue Recognition Credits

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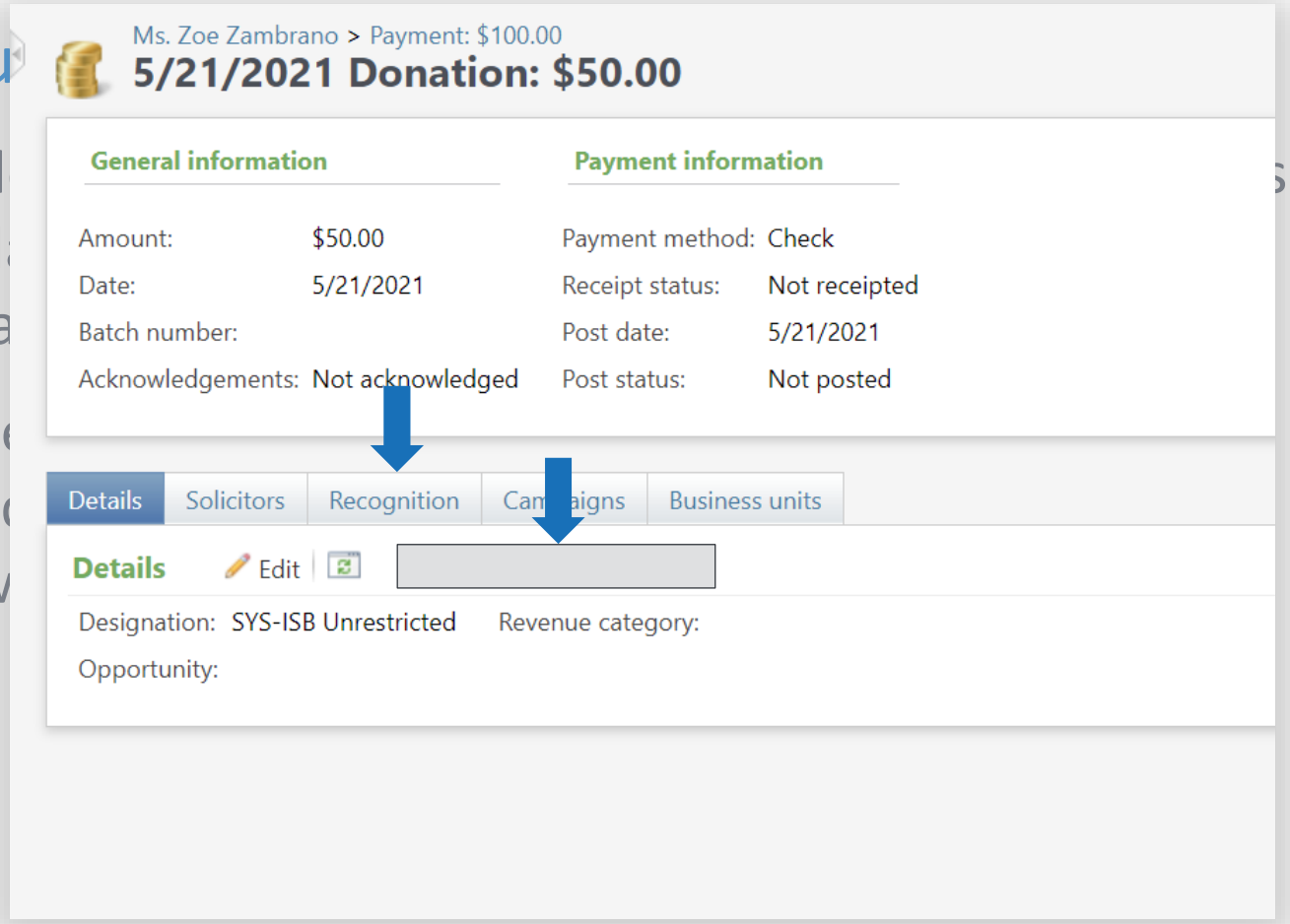

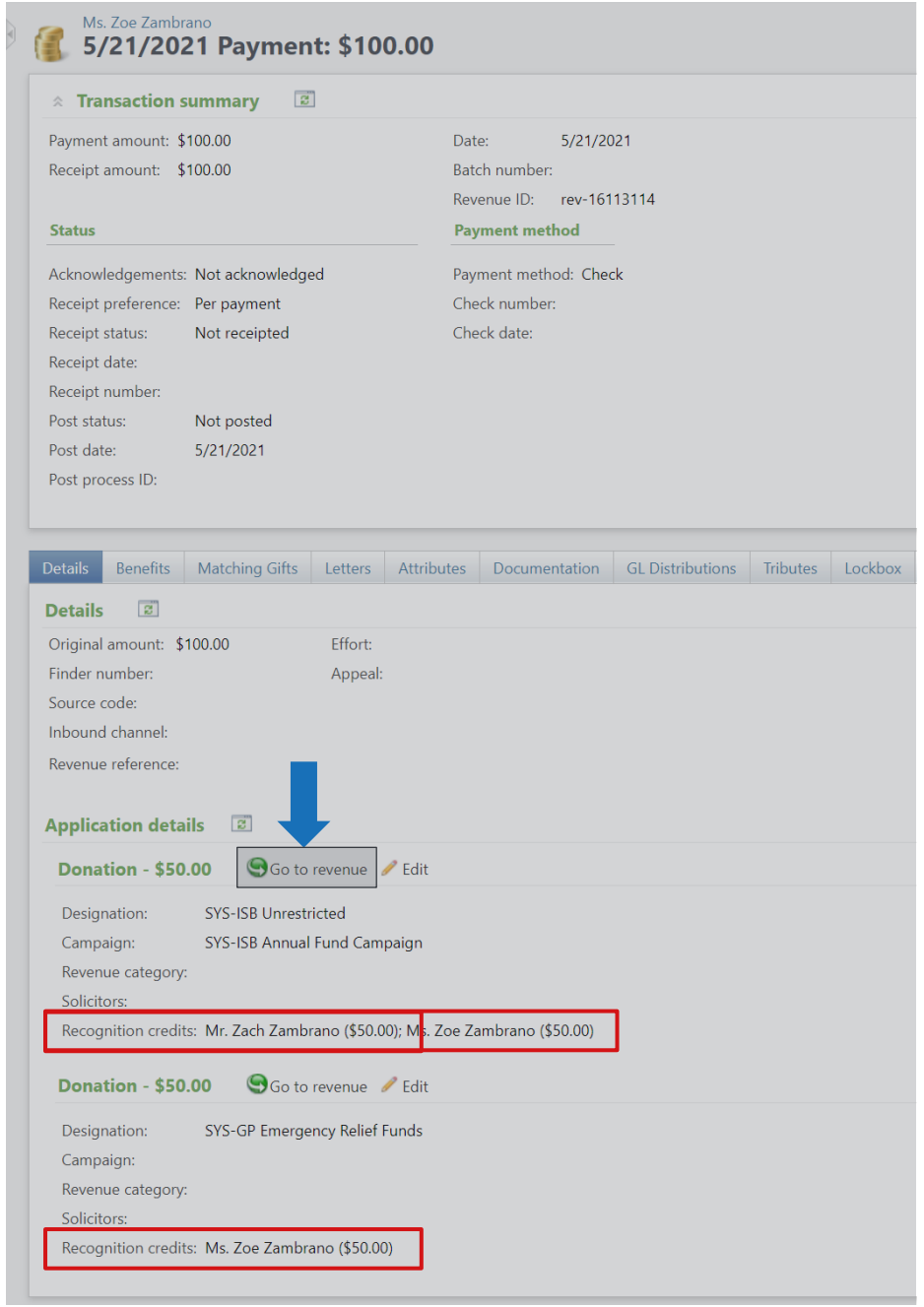

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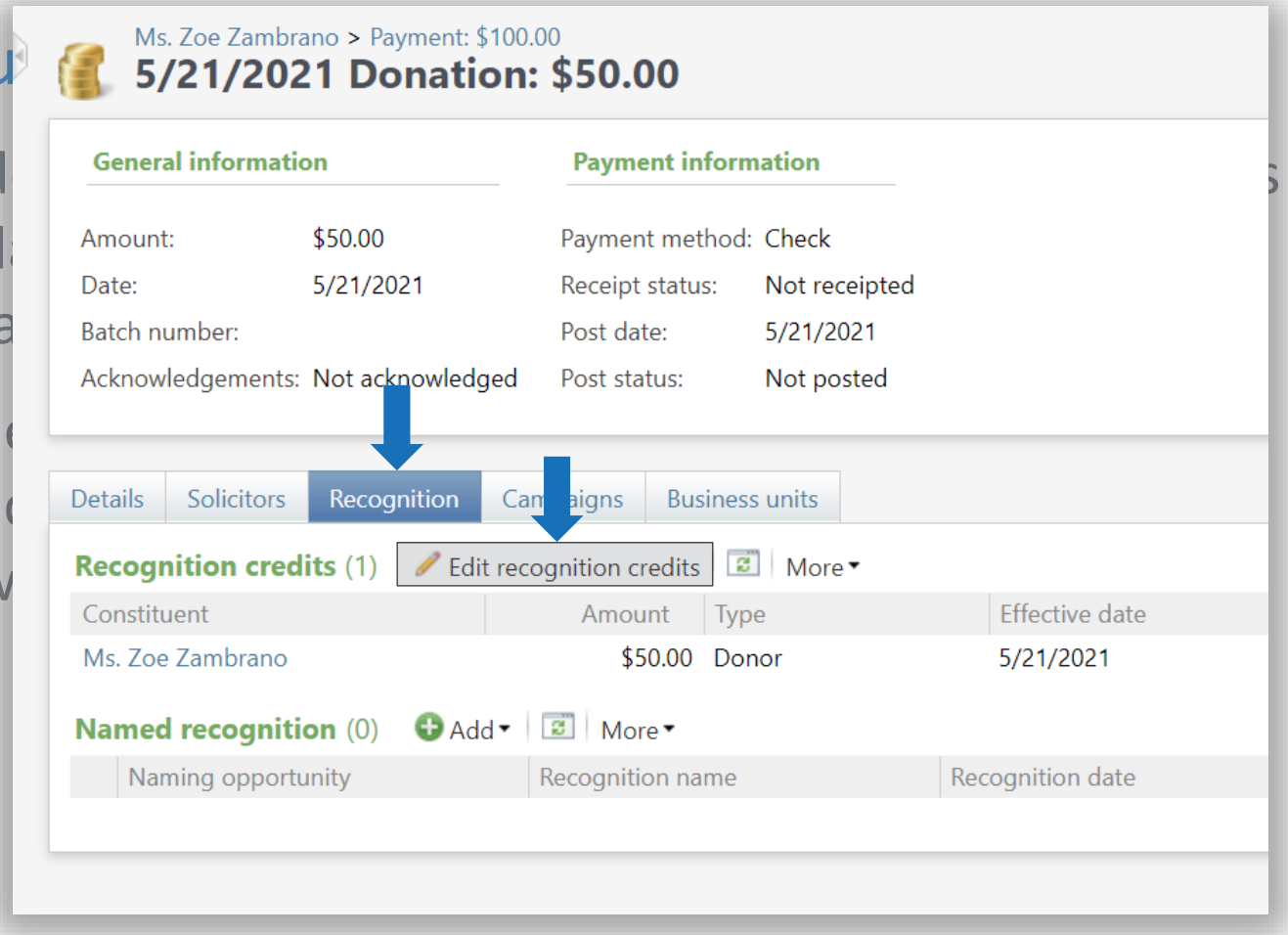

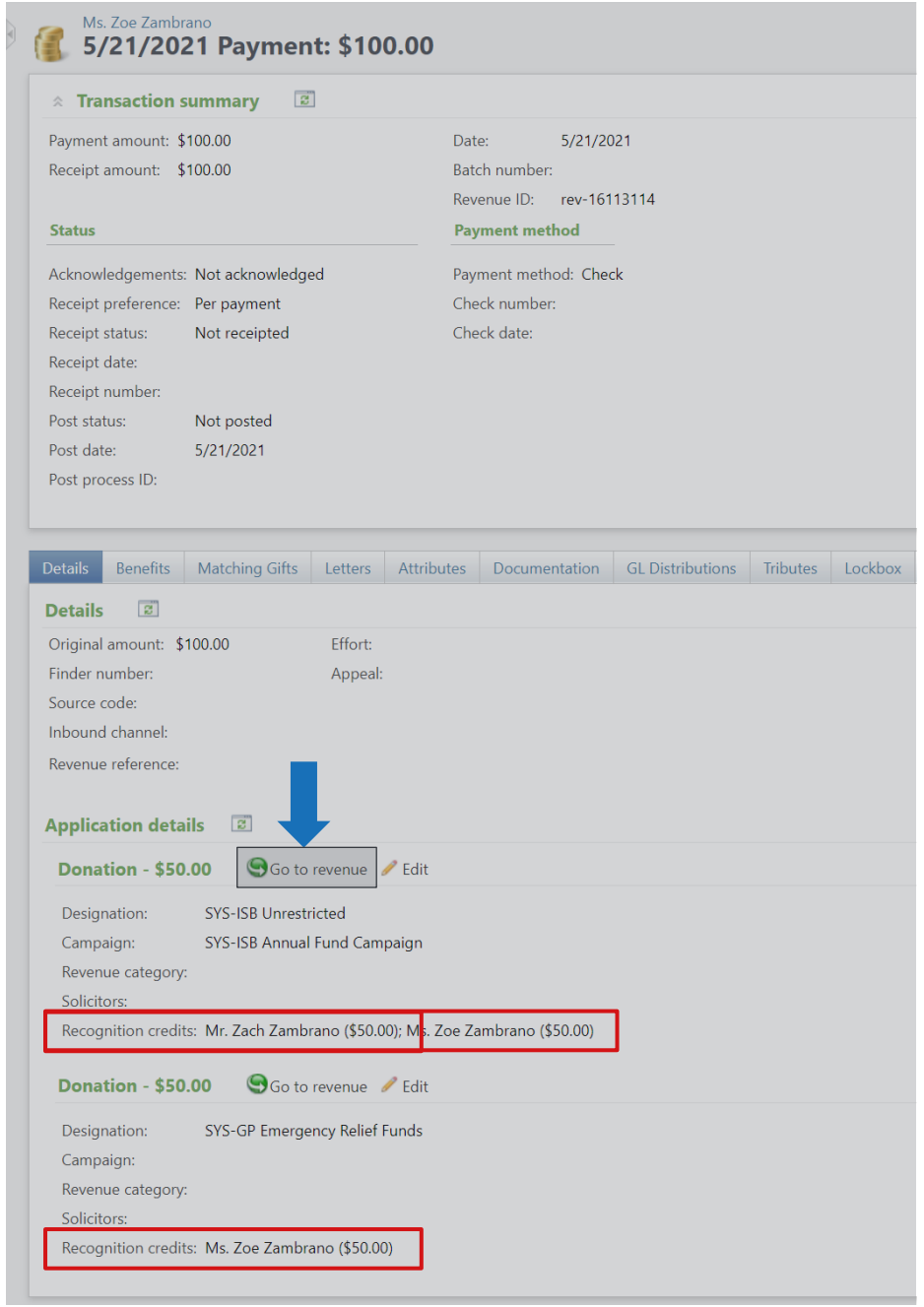

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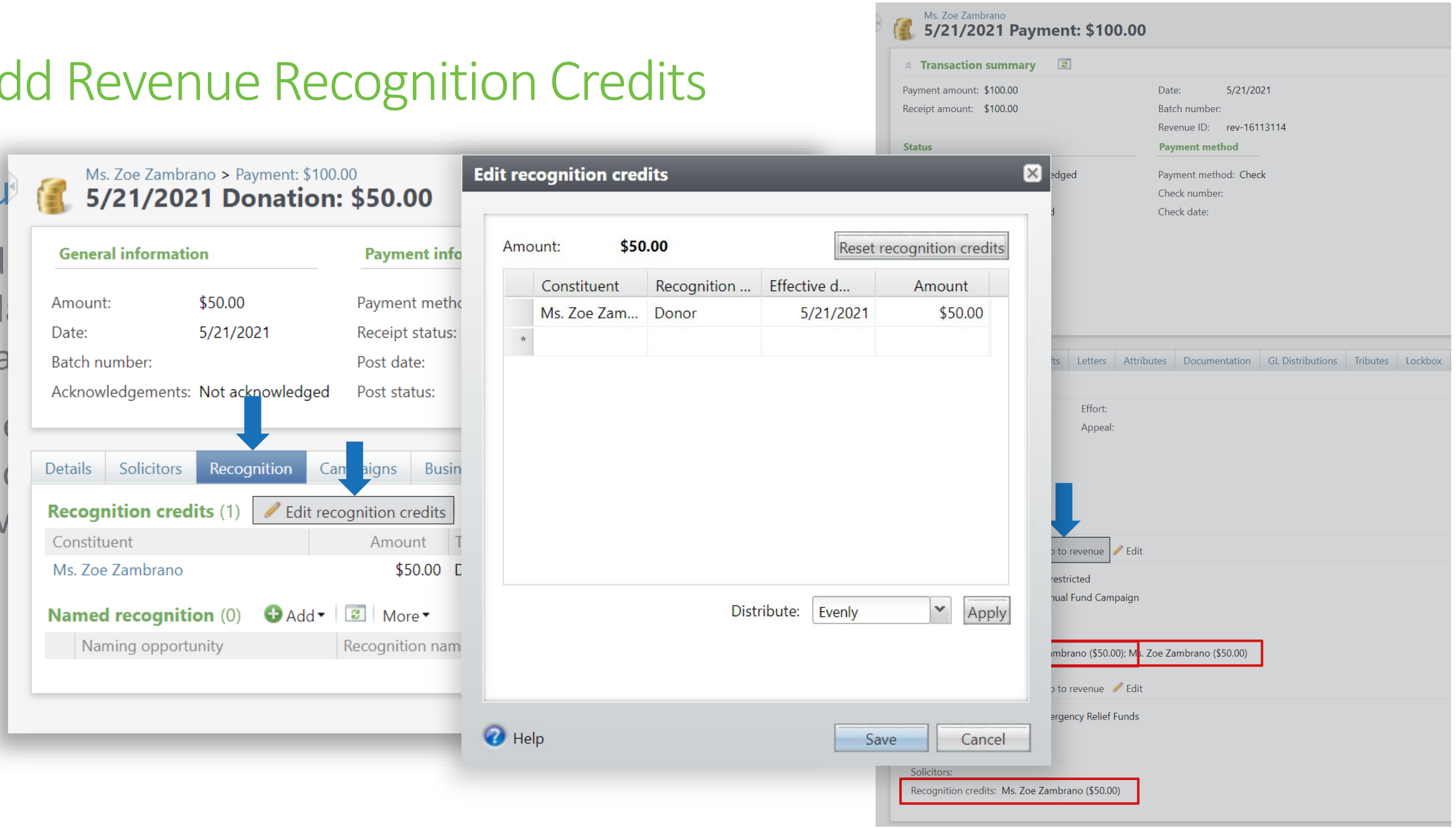

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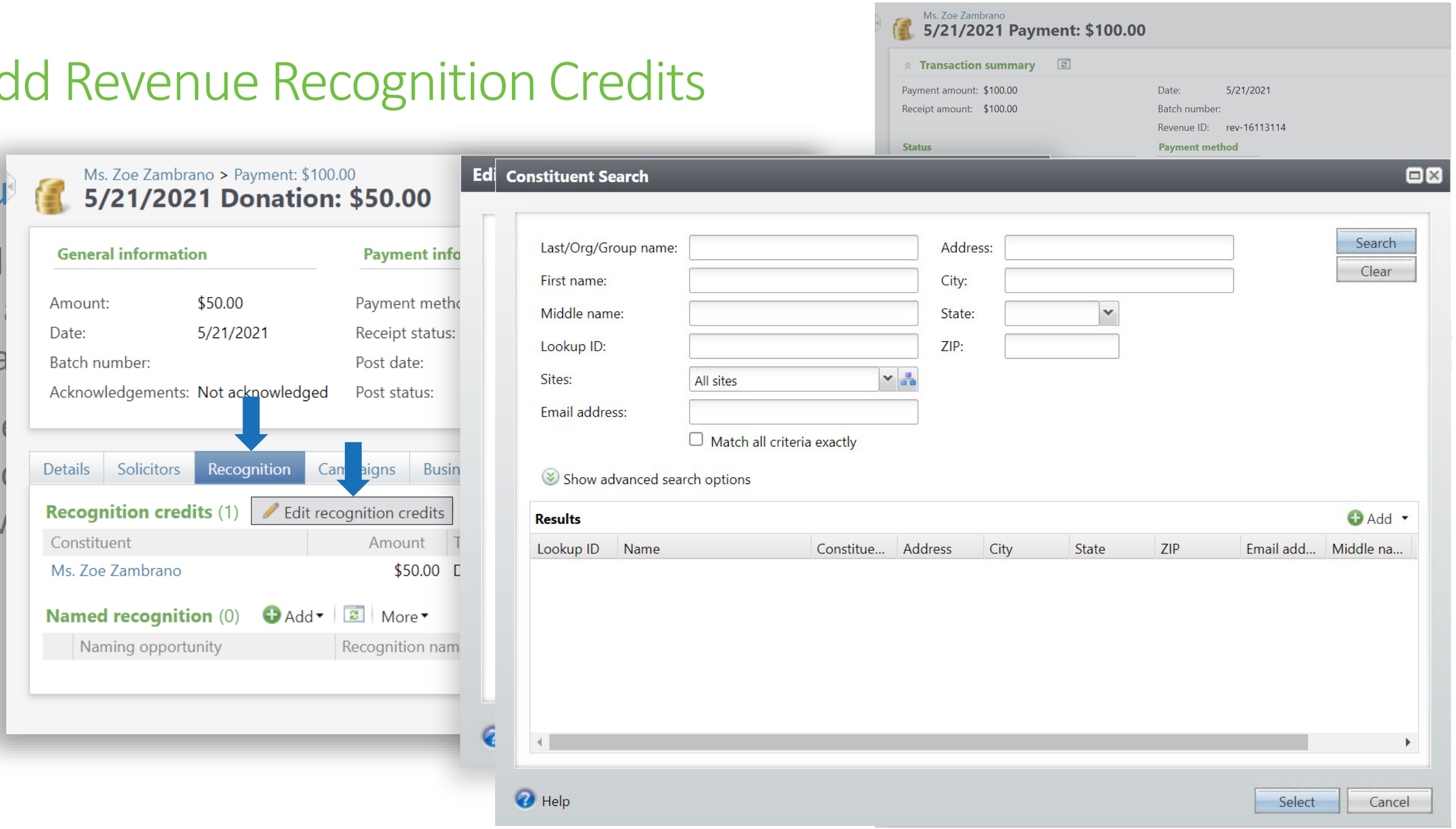
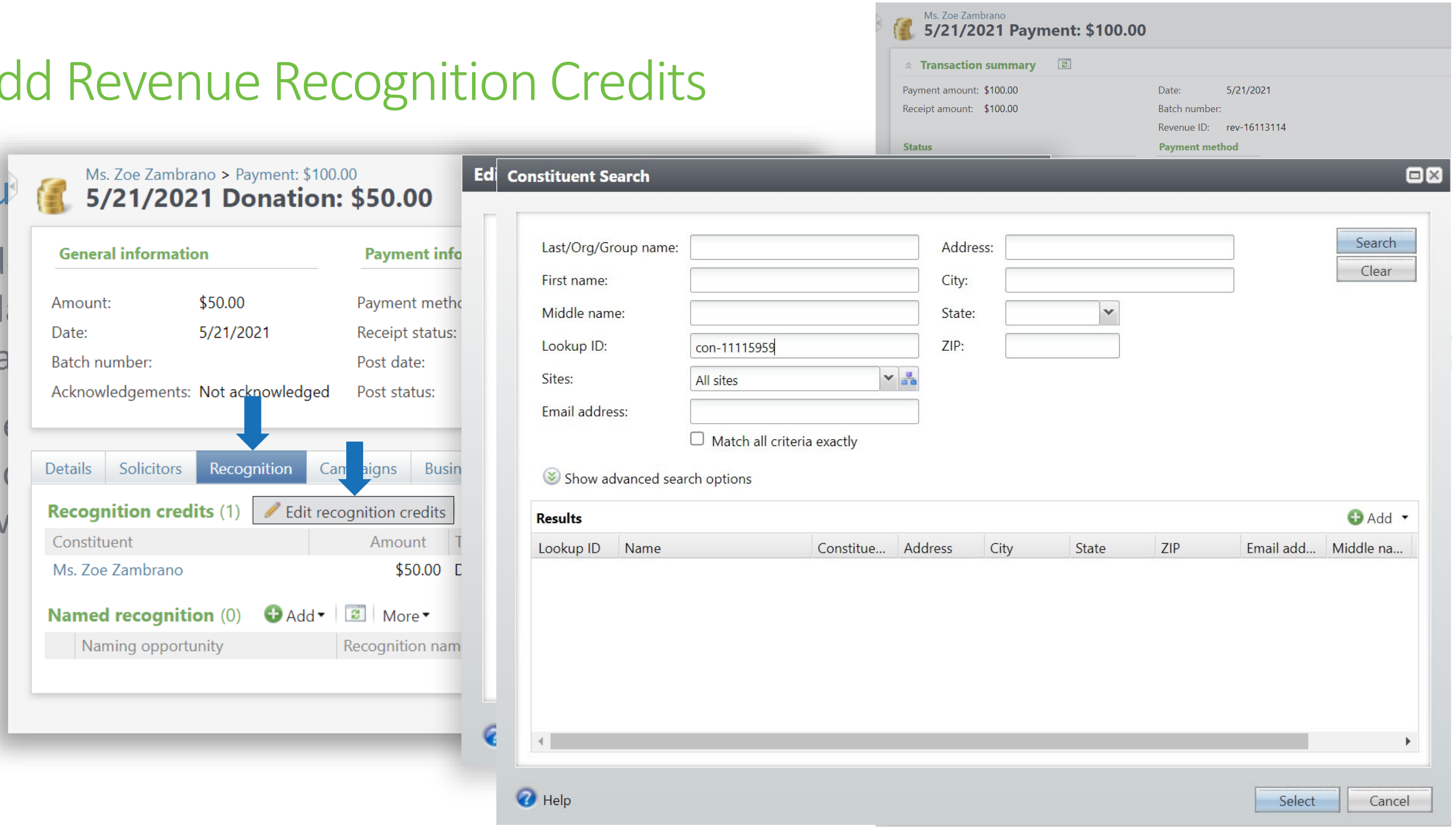


Add Revenue Recognition Credits



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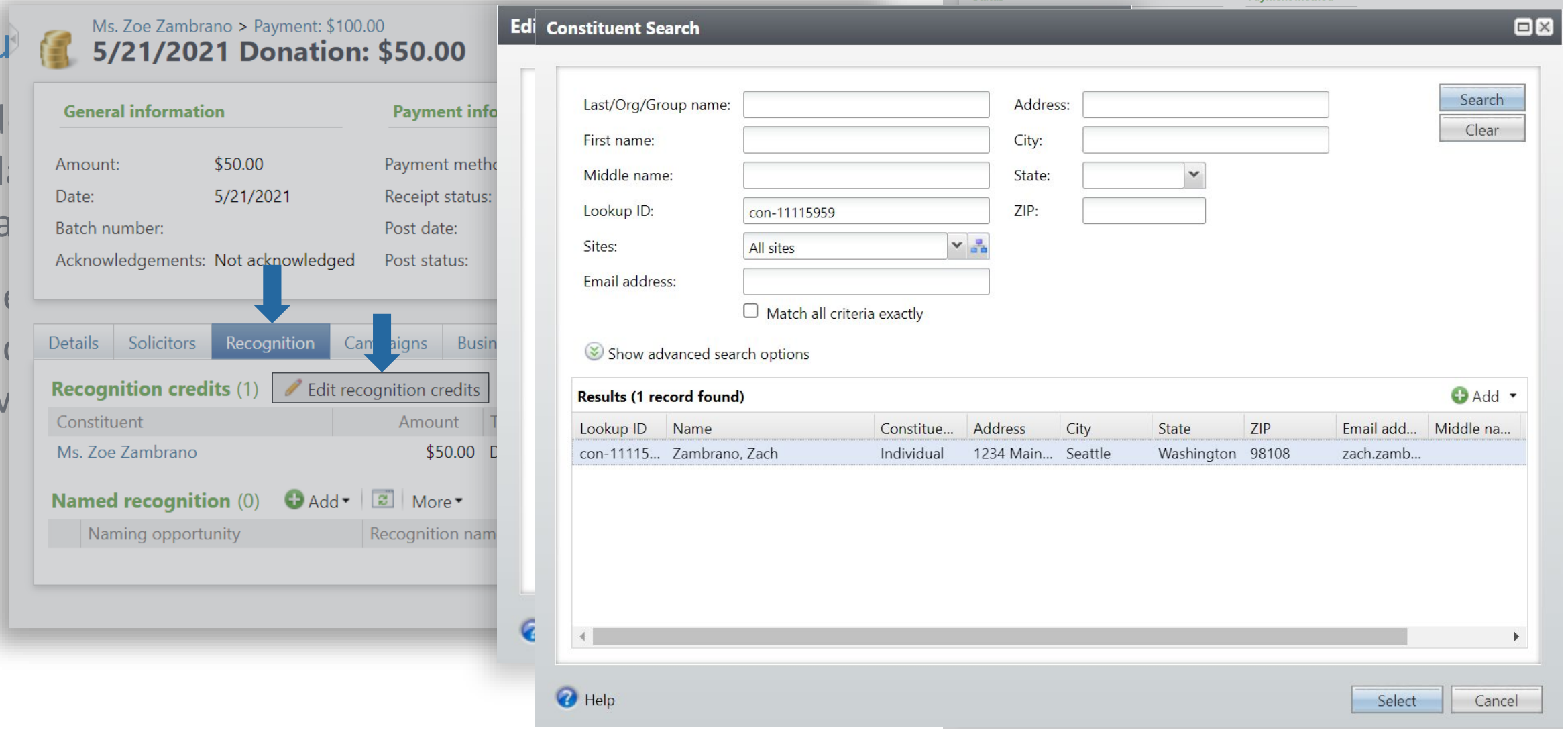

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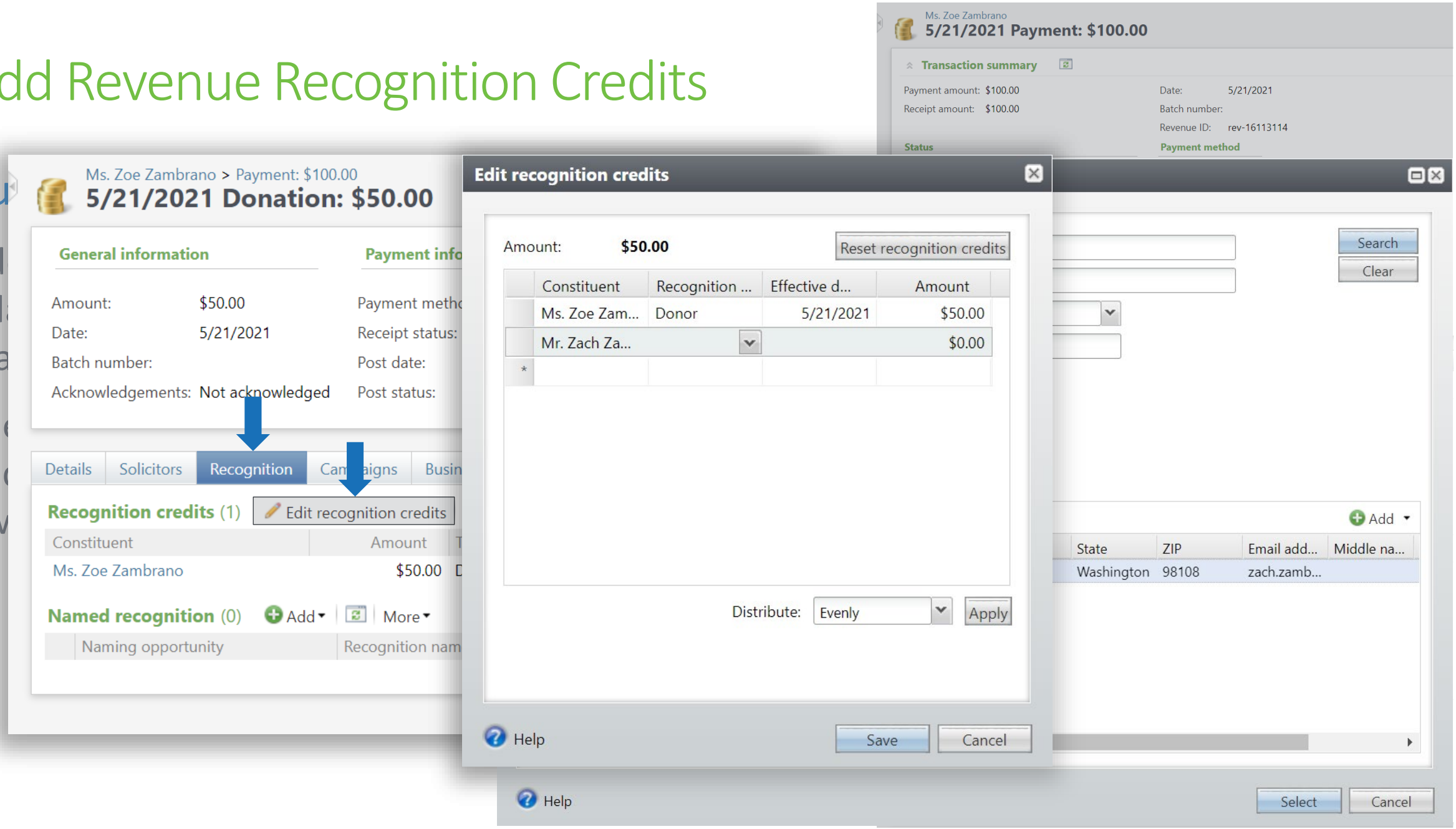

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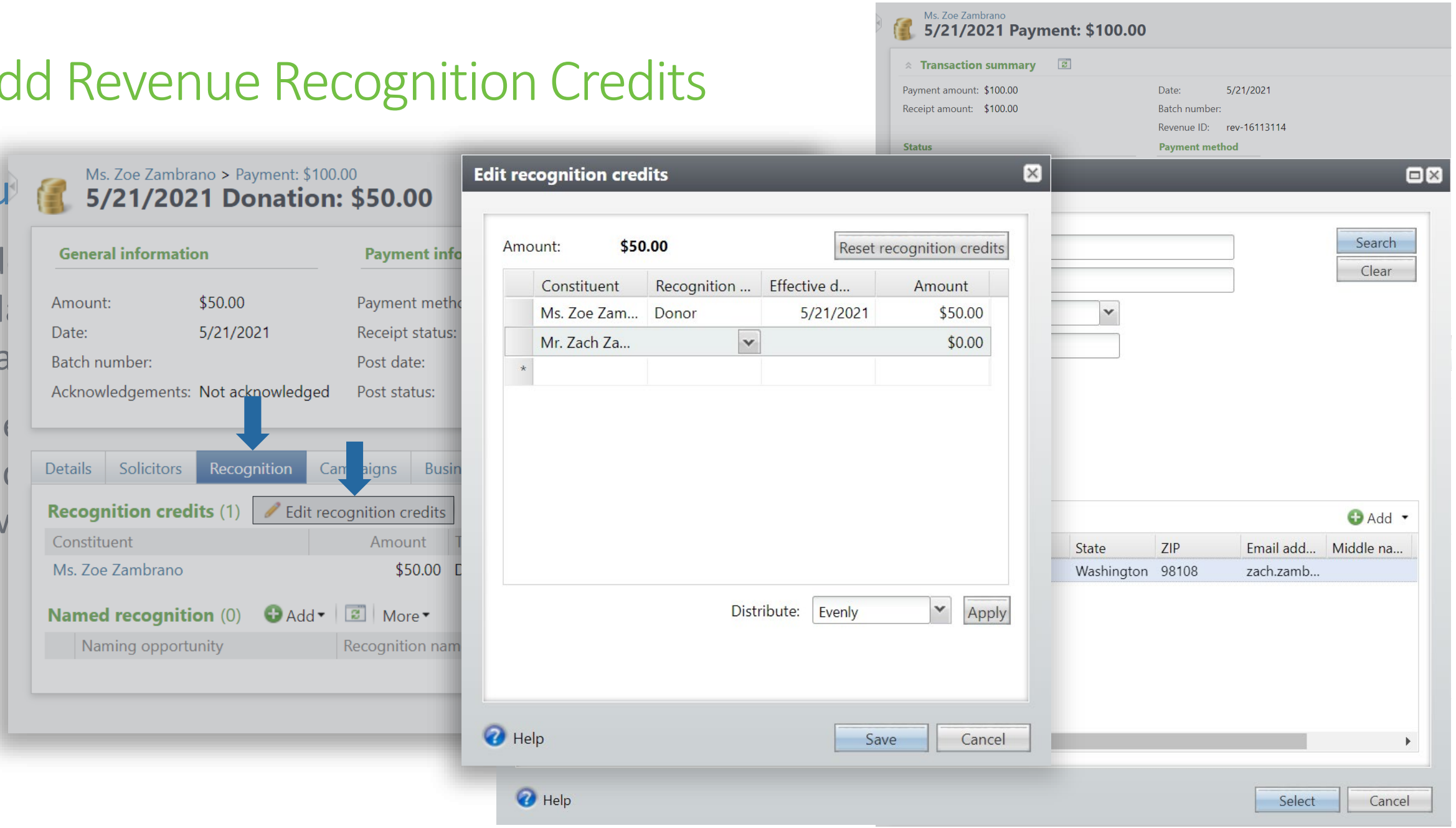

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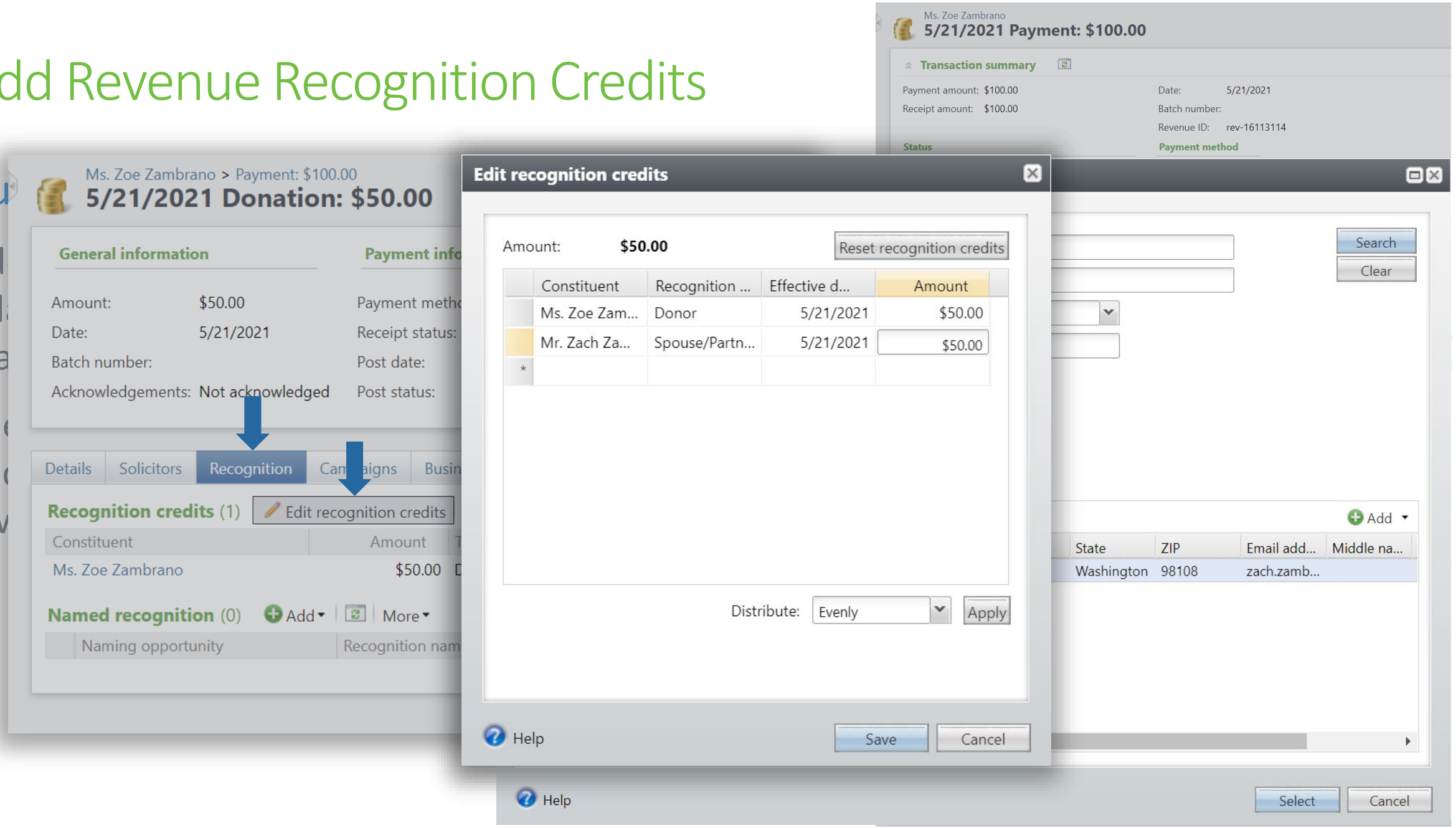

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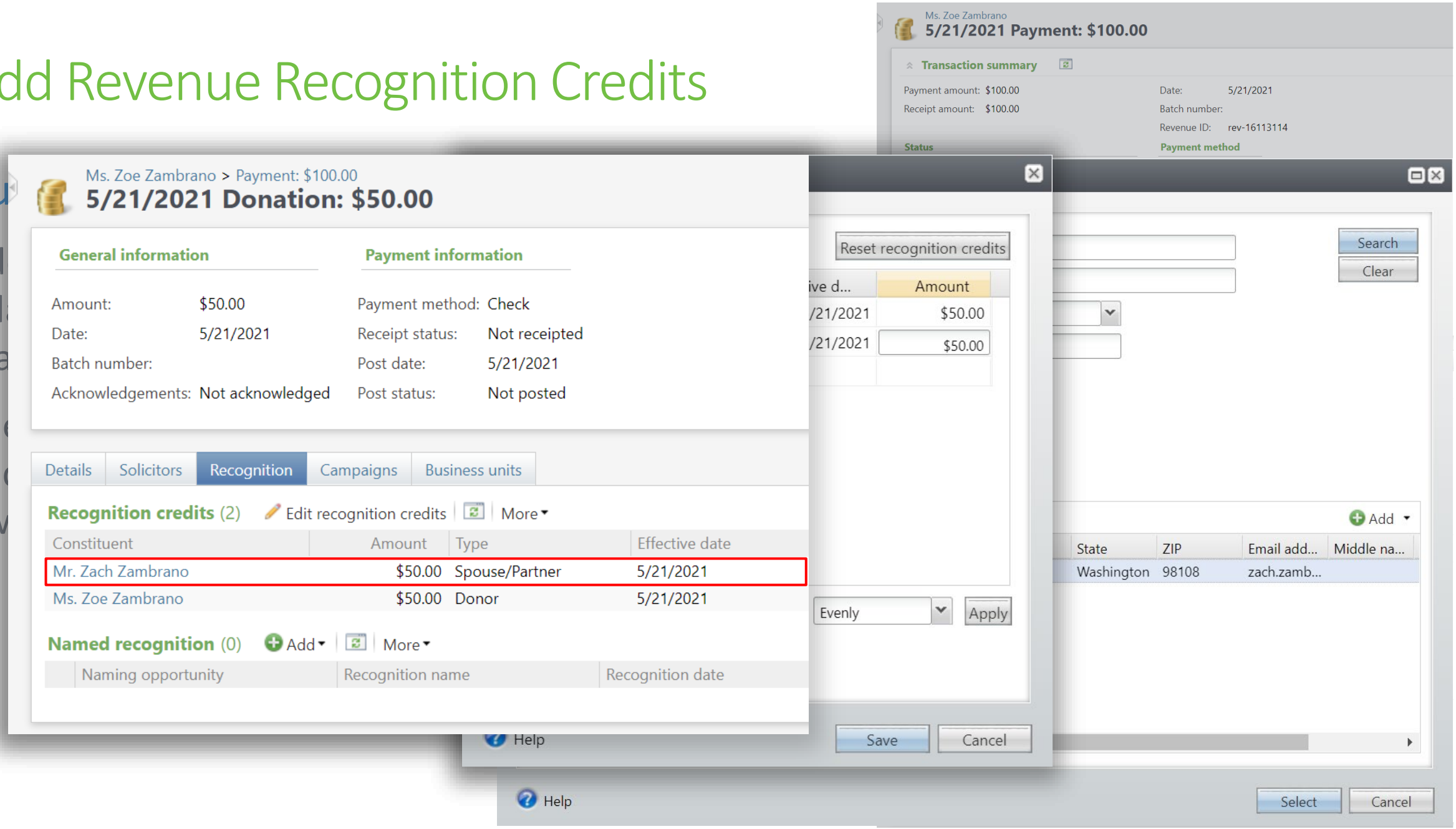


Add Revenue Recognition Credits

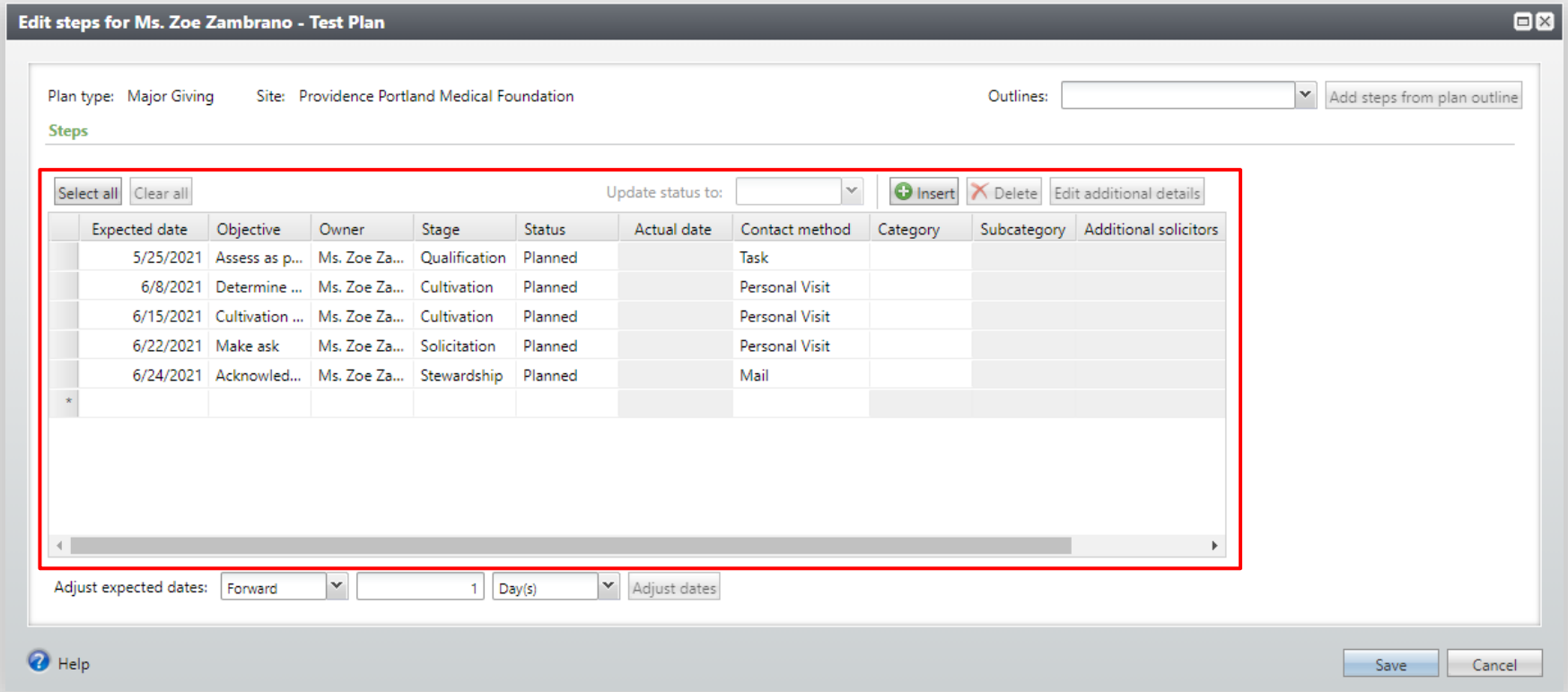
High-Level Requirements

- As a user I am able to add missing recognition credits to a revenue recognition default recipient's record en masse.
- As a user I am able to specify the source and recipient constituents, and the gifts to credit based on gift date, transaction type, and site.
- As a user I am able to specify the recognition type and match factor for the recognition credits added (default values based on revenue recognition default).
- Only a single user can add recognition credits at a time for a given revenue recognition default.

Add Revenue Recognition Credits

Design Process

- Initially considered using a UI Model Add form
- Collection object presents some UX challenges



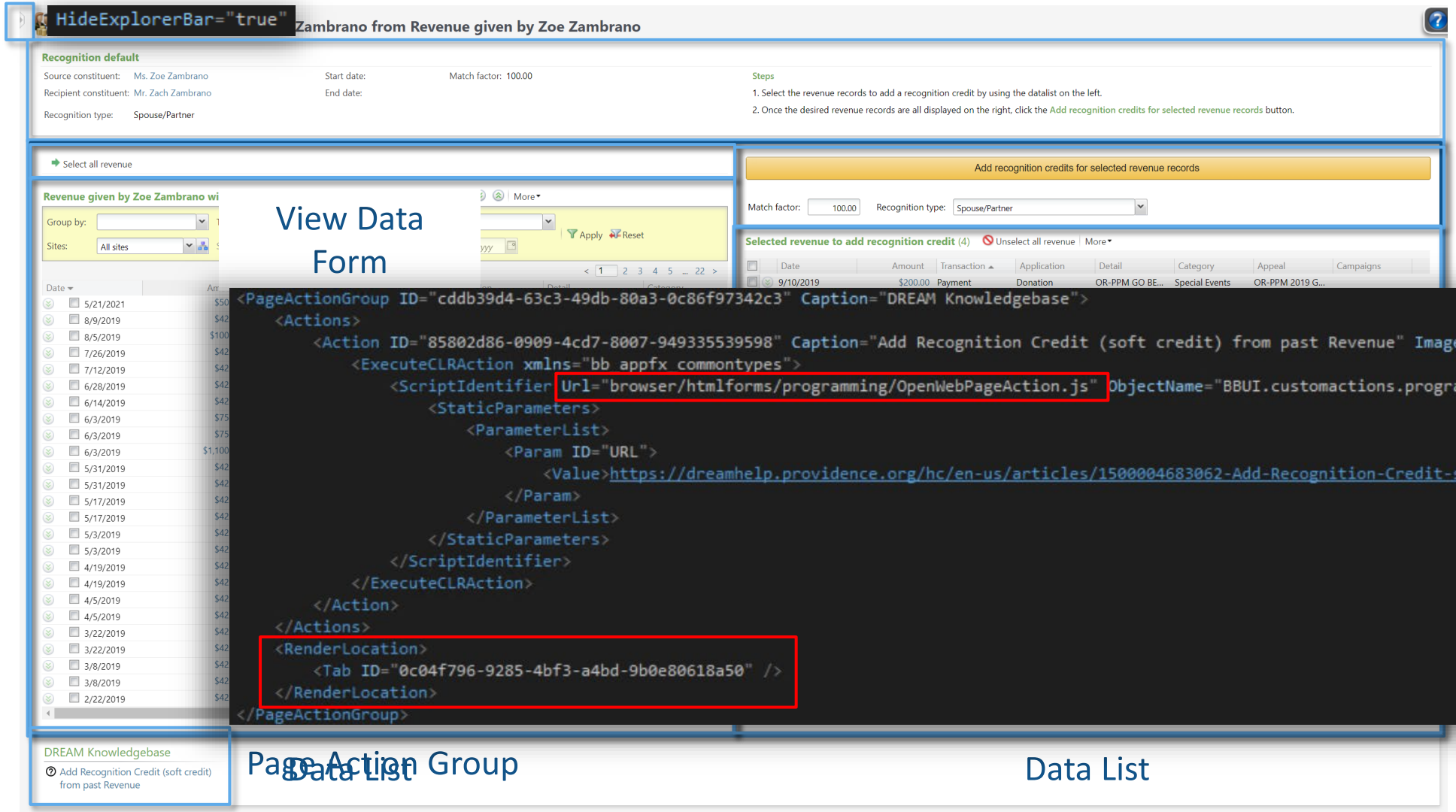
#bbdevdays

Add Revenue Recognition Credits Customization

DEMO

Add Revenue Recognition Credits

Page Anatomy

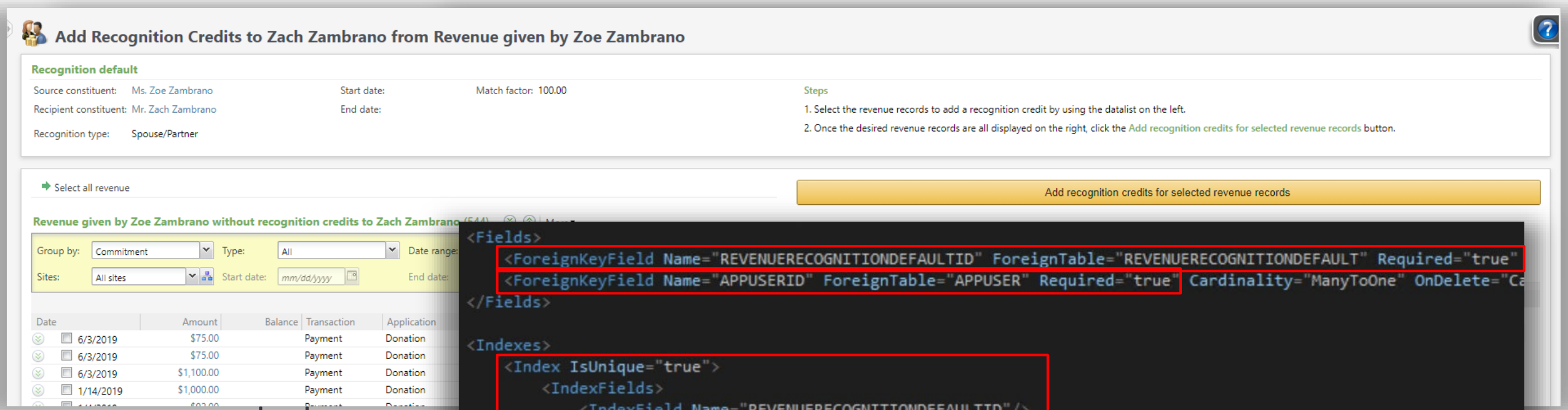



```
<PageActionGroup ID="cddb39d4-63c3-49db-80a3-0c86f97342c3" Caption="DREAM Knowledgebase">
    <Actions>
        <Action ID="85802d86-0909-4cd7-8007-949335539598" Caption="Add Recognition Credit (soft credit) from past Revenue" ImageKey="CATALOG:PSJH.CustomFx.CommonAsset
            <ExecuteCLRAction xmlns="bb_appfx_commontypes">
                <ScriptIdentifier Url="browser/htmlforms/programming/OpenWebPageAction.js" ObjectName="BBUI.customactions.programming.OpenWebPageAction">
                    <StaticParameters>
                        <ParameterList>
                            <Param ID="URL">
                                <Value>https://dreamhelp.providence.org/hc/en-us/articles/1500004683062-Add-Recognition-Credit-soft-credit-from-past-Revenue/</Value>
                            </Param>
                        </ParameterList>
                    </StaticParameters>
                </ScriptIdentifier>
            </ExecuteCLRAction>
        </Action>
    </Actions>
    <RenderLocation>
        <Tab ID="0c04f796-9285-4bf3-a4bd-9b0e80618a50" />
    </RenderLocation>
</PageActionGroup>
```

Summary Section
UI Model
View Data Form
Custom UI Model Form

Add Revenue Recognition Credits

Record Locking




```
<Fields>
    <ForeignKeyField Name="REVENUERECOGNITIONDEFAULTID" ForeignTable="REVENUERECOGNITIONDEFAULT" Required="true"
    <ForeignKeyField Name="APPUSERID" ForeignTable="APPUSER" Required="true" Cardinality="ManyToOne" OnDelete="Ca
</Fields>

<Indexes>
    <Index IsUnique="true">
        <IndexFields>
            <IndexField Name="REVENUERECOGNITIONDEFAULTID"/>
        </IndexFields>
    </Index>
</Indexes>
```

manage lock acquisition/failure

```
create procedure dbo.USR_PSJH_USP_RECOGNITIONCREDITADDFROMREVENUELOCKACQUIRE
(
    @REVENUERECOGNITIONDEFAULTID C72F456A-5249-450A-88EF-37902CAA7DC2 (Zoe's recognition default to Zach)
    @APPUSERID uniqueidentifier, BA1B4A9E-9E1E-47D8-822C-DC873D29A50C (David's APPUSERID)
    @LOCKACQUIRED bit output
)
as
begin
    declare @changeAgentId uniqueidentifier
    exec dbo.USP_CHANGEAGENT_GETORCREATECHANGEAGENT @changeAgentId output

    declare @currentDateTime datetime
    set @currentDateTime = getdate()

    set @LOCKACQUIRED = 0

    begin try

        if exists (select 1 from dbo.USR_PSJH_RECOGNITIONCREDITADDFROMREVENUELOCK where REVENUERECOGNITIONDEFAULTID = @REVENUERECOGNITIONDEFAULTID and APPUSERID = @APPUSERID)
        begin
            set @LOCKACQUIRED = 1
        end
        else
        begin
            insert dbo.USR_PSJH_RECOGNITIONCREDITADDFROMREVENUELOCK (REVENUERECOGNITIONDEFAULTID, APPUSERID, ADDEDBYID, CHANGEDBYID, DATEADDED, DATECHANGED)
            select
                @REVENUERECOGNITIONDEFAULTID,
                @APPUSERID,
                @changeAgentId,
                @changeAgentId,
                @currentDateTime,
                @currentDateTime

            set @LOCKACQUIRED = 1
        end
    end try
    begin catch
        set @LOCKACQUIRED = 0
    end catch

    return 0;
end
```

USR_PSJH_RECOGNITIONCREDITADDFROMREVENUELOCK

	ID	REVENUERECOGNITIONDEFAULTID	APPUSERID
1	74DBC092-A2DA-4AC8-837B-8EEABF513AAB	C72F456A-5249-450A-88EF-37902CAA7DC2	BA1B4A9E-9E1E-47D8-822C-DC873D29A50C

Add Revenue Recognition Credits

User Feedback

I love this function! I think I use it multiple times daily. Updating recognition credit had always been a bit of a chore when connecting spouses with existing constituent records, but now it is so simple.

I really can't express how much I appreciate this function. Each time I use it, I think of how much time I'd be spending on updating recognition without it.

#bbdevdays

Catalog Browser Enhancement

DEVELOPER TOOL

Catalog Browser Enhancement

Overview

- As an admin I can search for any spec that has been loaded to the database
- As an admin I can view/download any spec that has been loaded to the database
- As an admin I can unload any spec that has been loaded to the database (with some exceptions)

#bbdevdays

Catalog Browser Enhancement

DEMO

Catalog Browser Enhancement

Key elements

- The Data List selects from all the individual catalog tables

```
select ID, null, NAME, DESCRIPTION, 2, 'DataList', DATALISTSPEC.value('declare namespace ns="bb_appfx_datalist"; (ns:DataListSpec/@Author)[1]', 'nvarchar(max)'), ADDEDBYID, DATEADDED, CHANGEDBYID, DATECHANGED from dbo.DATALISTCATALOG
union all
select ID, null, NAME, DESCRIPTION, 43, 'FeatureGroup', SPECXML.value('declare namespace ns="bb_appfx_featuregroup"; (ns:FeatureGroupSpec/@Author)[1]', 'nvarchar(max)'), ADDEDBYID, DATEADDED, CHANGEDBYID, DATECHANGED from dbo.FEATUREGROUPCATALOG
union all
select ID, null, NAME, DESCRIPTION, 4, 'FunctionalArea', FUNCTIONALAREASPECXML.value('declare namespace ns="bb_appfx_functionalarea"; (ns:FunctionalAreaSpec/@Author)[1]', 'nvarchar(max)'), ADDEDBYID, DATEADDED, CHANGEDBYID, DATECHANGED from dbo.FUNCTIONA
union all
select ID, null, GLOBALCHANGESPECXML.value('declare namespace ns="bb_appfx_globalchange"; (ns:GlobalChangeSpec/@Name)[1]', 'nvarchar(max)'), DESCRIPTION, 28, 'GlobalChange', GLOBALCHANGESPECXML.value('declare namespace ns="bb_appfx_globalchange"; (ns:Glo
union all
select ID, null, NAME, DESCRIPTION, 21, 'IDMapper', IDMAPPERSPECXML.value('declare namespace ns="bb_appfx_idmapper"; (ns:IDMapperSpec/@Author)[1]', 'nvarchar(max)'), ADDEDBYID, DATEADDED, CHANGEDBYID, DATECHANGED from dbo.IDMAPPERCATALOG
union all
select ID, null, NAME, DESCRIPTION, 25, 'KPI', SPECXML.value('declare namespace ns="bb_appfx_kpi"; (ns:KpiSpec/@Author)[1]', 'nvarchar(max)'), ADDEDBYID, DATEADDED, CHANGEDBYID, DATECHANGED from dbo.KPICATALOG
```

```
public enum CatalogItemType
{
    AddDataFormTemplateSpec,
    CodeTableSpec,
    DataListSpec,
    EditDataFormTemplateSpec,
    FunctionalAreaSpec,
    PackageSpec,
    PageDefinitionSpec,
    QueryViewSpec,
    QueryViewSpecExtension,
    ReportSpec,
    SearchListSpec,
    SimpleDataListSpec,
    SmartQuerySpec,
    SQLFunctionSpec,
    SQLStoredProcedureSpec,
    TableSpec,
    TableSpecExtension,
    TaskSpec,
    TranslationFunctionSpec,
    ViewDataFormTemplateSpec,
    BatchTypeSpec,
    IDMapperSpec,
    BusinessProcessSpec,
    RecordOperationSpec,
    FlashDashSpec,
    KpiSpec,
    MergeTaskSpec,
    SmartFieldSpec,
    GlobalChangeSpec,
    WebDashboardPageSpec,
    SystemPrivilegeSpec,
    ConfigurationDataSpec,
    BatchTypeExtensionSpec,
    MapEntitySpec,
    DataFormAddInSpec,
    WorkflowSpec,
    CustomUIModelMetadata,
    CalendarSpec,
    RelationshipMapSpec,
    UIWidgetSpec,
    WorkflowInboxSpec,
    SQLViewSpec,
    TaskWizardSpec,
    FeatureGroupSpec,
    BatchTypeAddInSpec,
    WebPageModelSpec
}
```

Catalog Browser Enhancement

Key elements

- The Data List selects from all the individual catalog tables
- View XML and Unload Spec actions require a spec type enumeration found in Blackbaud.AppFx.XmlTypes.CatalogItemType
- The Unload Spec Record Operation calls the Blackbaud CLR stored procedure USP_UNLOADSPEC

  USP_UNLOADSPEC is the sproc called by the UnloadSpec method in the SpecLoader class contained in the Blackbaud.AppFx.SpecHelpers assembly, which is called by LoadSpec.exe

```
public enum CatalogItemType
{
    AddDataFormTemplateSpec,
    CodeTableSpec,
    DataListSpec,
    EditDataFormTemplateSpec,
    FunctionalAreaSpec,
    PackageSpec,
    PageDefinitionSpec,
    QueryViewSpec,
    QueryViewSpecExtension,
    ReportSpec,
    SearchListSpec,
    SimpleDataListSpec,
    SmartQuerySpec,
    SQLFunctionSpec,
    SQLStoredProcedureSpec,
    TableSpec,
    TableSpecExtension,
    TaskSpec,
    TranslationFunctionSpec,
    ViewDataFormTemplateSpec,
    BatchTypeSpec,
    IDMapperSpec,
    BusinessProcessSpec,
    RecordOperationSpec,
    FlashDashSpec,
    KpiSpec,
    MergeTaskSpec,
    SmartFieldSpec,
    GlobalChangeSpec,
    WebDashboardPageSpec,
    SystemPrivilegeSpec,
    ConfigurationDataSpec,
    BatchTypeExtensionSpec,
    MapEntitySpec,
    DataFormAddInSpec,
    WorkflowSpec,
    CustomUIModelMetadata,
    CalendarSpec,
    RelationshipMapSpec,
    UIWidgetSpec,
    WorkflowInboxSpec,
    SQLViewSpec,
    TaskWizardSpec,
    FeatureGroupSpec,
    BatchTypeAddInSpec,
    WebPageModelSpec
}
```

Catalog Browser Enhancement

Unload Spec Record Operation

```
<RecordOperationSpec
    xmlns="bb_appfx_recordoperation"
    xmlns:c="bb_appfx_commontypes"
    ID="c4f2106c-6828-4d99-8a6b-08e2f80b18cf"
    Name="Unload Spec Record Operation"
    Description="Unload a spec from the database"
    Author="PSJH\Cary Mayeda"
    OperationType="Delete"
    RecordType="SDK Spec"
    c:SecurityUIFolder="DREAM Information Services\Administration"
```

This utilizes the Blackbaud CLR sproc USP_UNLOADSPEC, which is the sproc that is called when you unload a spec using "loadspec.exe /u".

It takes three parameters:

@SPECTYPE	int	This is a zero based enumeration of spec types (see "Catalog Browser - All Loaded Specs Data List"
@SPECID	uniqueidentifier	The ID of the spec to unload
@CHANGEAGENTID	uniqueidentifier	

Note: USP_UNLOADSPEC requires the call to be wrapped in a transaction

```
create procedure dbo.USR_PSJH_USP_RECORDOPERATION_UNLOADSPEC
(
    @ID nvarchar(40),
    @CHANGEAGENTID uniqueidentifier
)
as begin
    if @CHANGEAGENTID is null
        exec dbo.USP_CHANGEAGENT_GETORCREATECHANGEAGENT @CHANGEAGENTID output;

    declare @SpecID uniqueidentifier
    declare @SpecType int

    begin try
        set @SpecID = cast (substring(@ID, 1, 36) as uniqueidentifier)
        set @SpecType = cast (substring(@ID, 38, 3) as int)

        begin transaction
        exec dbo.USP_UNLOADSPEC @SpecType, @SpecID, @CHANGEAGENTID
        commit transaction
    end try
    begin catch
        if @@TRANCOUNT > 0
            rollback transaction

        exec dbo.USP_RAISE_ERROR;
        return 1;
    end catch

    return 0;

end
            ]]>
        </c:CreateProcedureSQL>
    </SPOperationImplementation>
</SPRecord>
```

```
begin transaction
exec dbo.USP_UNLOADSPEC @SpecType, @SpecID, @CHANGEAGENTID
commit transaction
```

Catalog Browser Enhancement

Things to note

- Some specs like batch extensions take too long to unload and timeout. I chose not to increase the timeout, since these can take hours.
- USP_UNLOADSPEC does not currently support unloading Query View Extension specs
- The spec types that are not included yet in my code are:
  - TableSpecExtension
  - CustomUIModelMetadata
  - WorkflowInboxSpec
  - WebPageModelSpec

Catalog Browser Enhancement

Things to note

- SystemPrivilege does not store the XML spec in the catalog table, so the View XML action is disabled

cary.mayeda@providence.org

Hello! I'm Dan Napolitano

He/They/Him/Them

AT PSJH FOUNDATION: 2 YEARS

10 years in private sector at Liberty Mutual in roles as reporting analyst, systems analyst, and manager of QA team for their e-commerce website.

10 years in non-profit at Portland State University Foundation and now Providence St. Joseph Health Foundation in roles as report analyst, Director of Reporting and Analytics, and CRM developer.

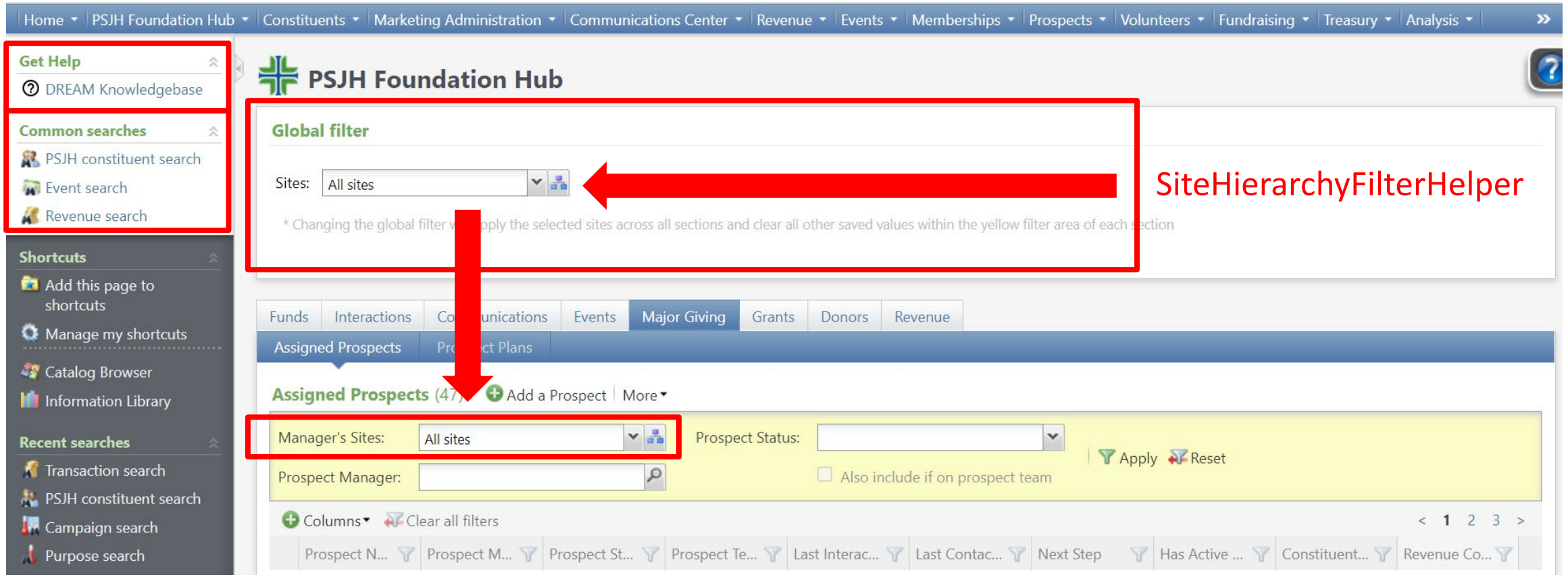
Problem: Easy Data Access

- Make access to data easy but flexible.
- Replace list-based export ‘reports’ with in-client presented lists.
- Deliver quickly without adding the feeling of clutter to CRM.
- Design keeping in mind future CRM growth and vision.

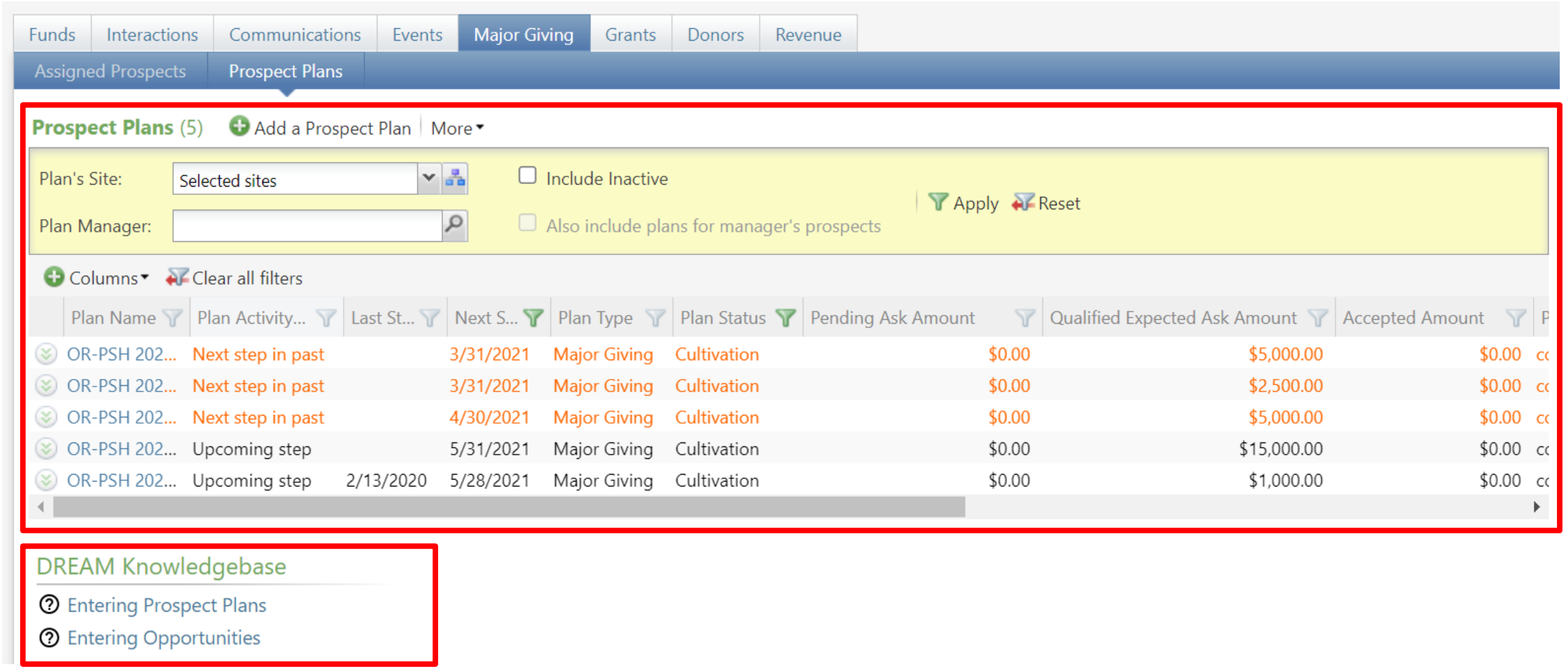
Solution: Foundation Hub

- Start with list builders but allow for future BI/report options:
  - Familiar functionality.
  - Flexible sort, filter, column preferences, export.
- Gain adoption across business units by diversifying list types:
  - Funds; Events; Interactions; Communications; Assigned Prospects; Plans.
- Implement as new functional area:
  - Functional area effectively is a page spec.
  - Functional area task performs ‘ShowPage’ where header attribute IsFunctionalAreaDefault="true“
- Intent to reduce functional areas over time in order to lessen the feeling of clutter.

Solution: Layout

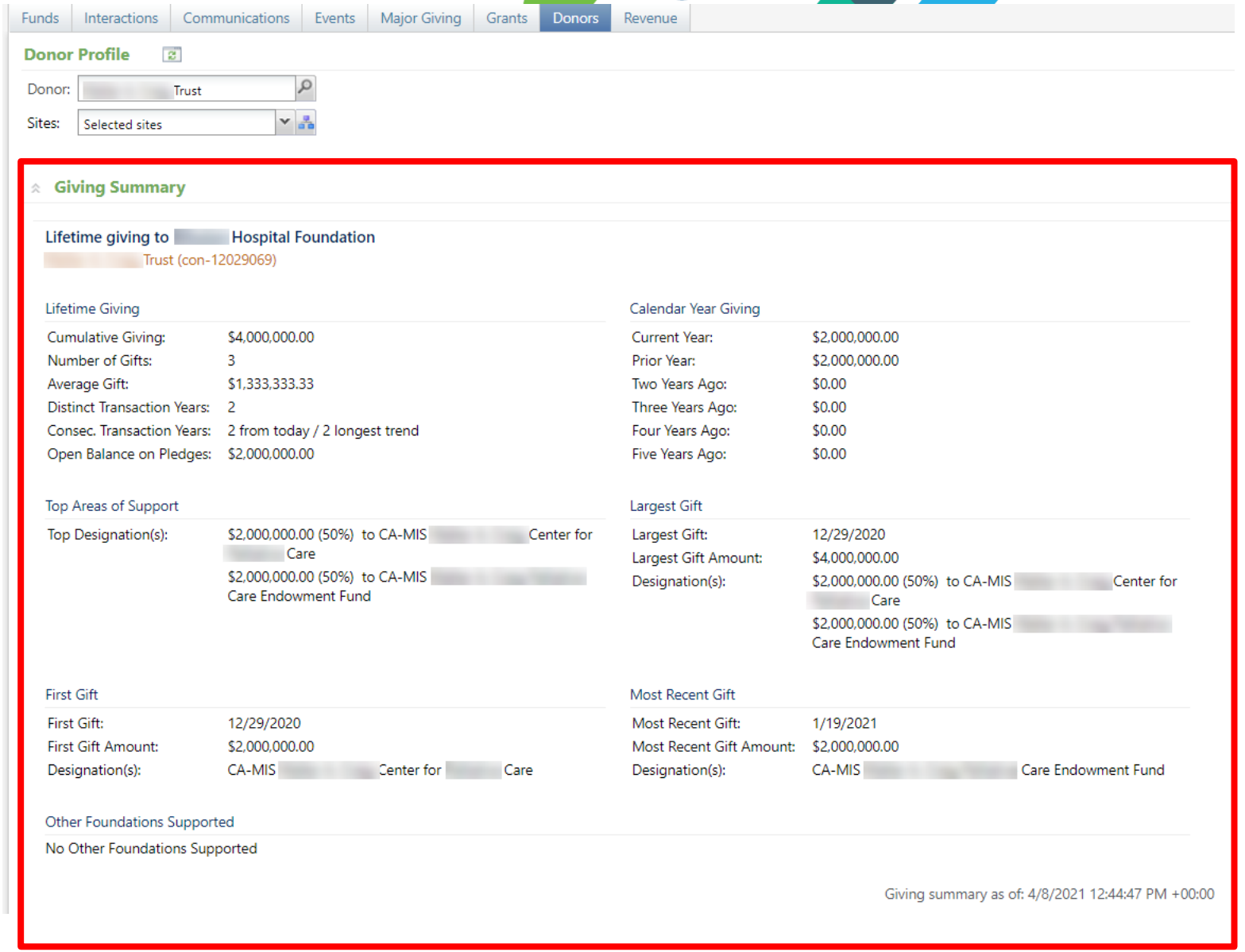


Solution: Plans Tab with List builder



Solution: Donors tab with View Data Form

```
<RenderStyle>
      <RepeaterView>
            <DetailViewForm ViewDataFormID=“"/>
      </RepeaterView>
</RenderStyle>
```



Learned During Process

- List builders tend to run slower than data lists.
- List builders appear to run SQL twice.
- Top level filter will clear non-dependent parameters in dependent sections.
- Ideally the final design will move away from a hub and largely transfer what are tabs in the Hub to replace the existing CRM functional areas.

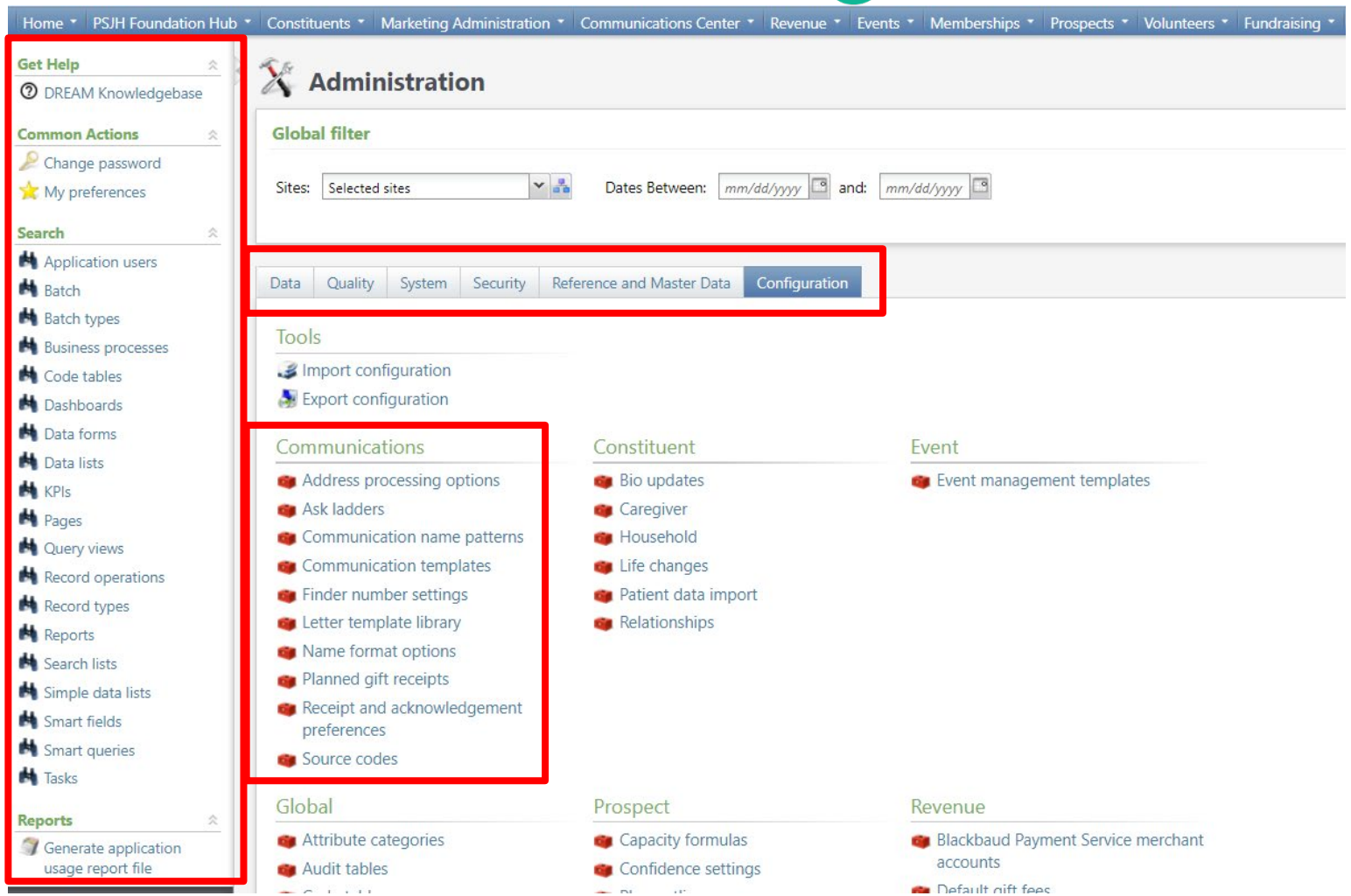
Reception

- Feedback has been extremely positive.
- Admins and managers appreciate the context-less view.
- Users appreciate embedded actions.
- New field requests common.
- New tab requests on occasion.

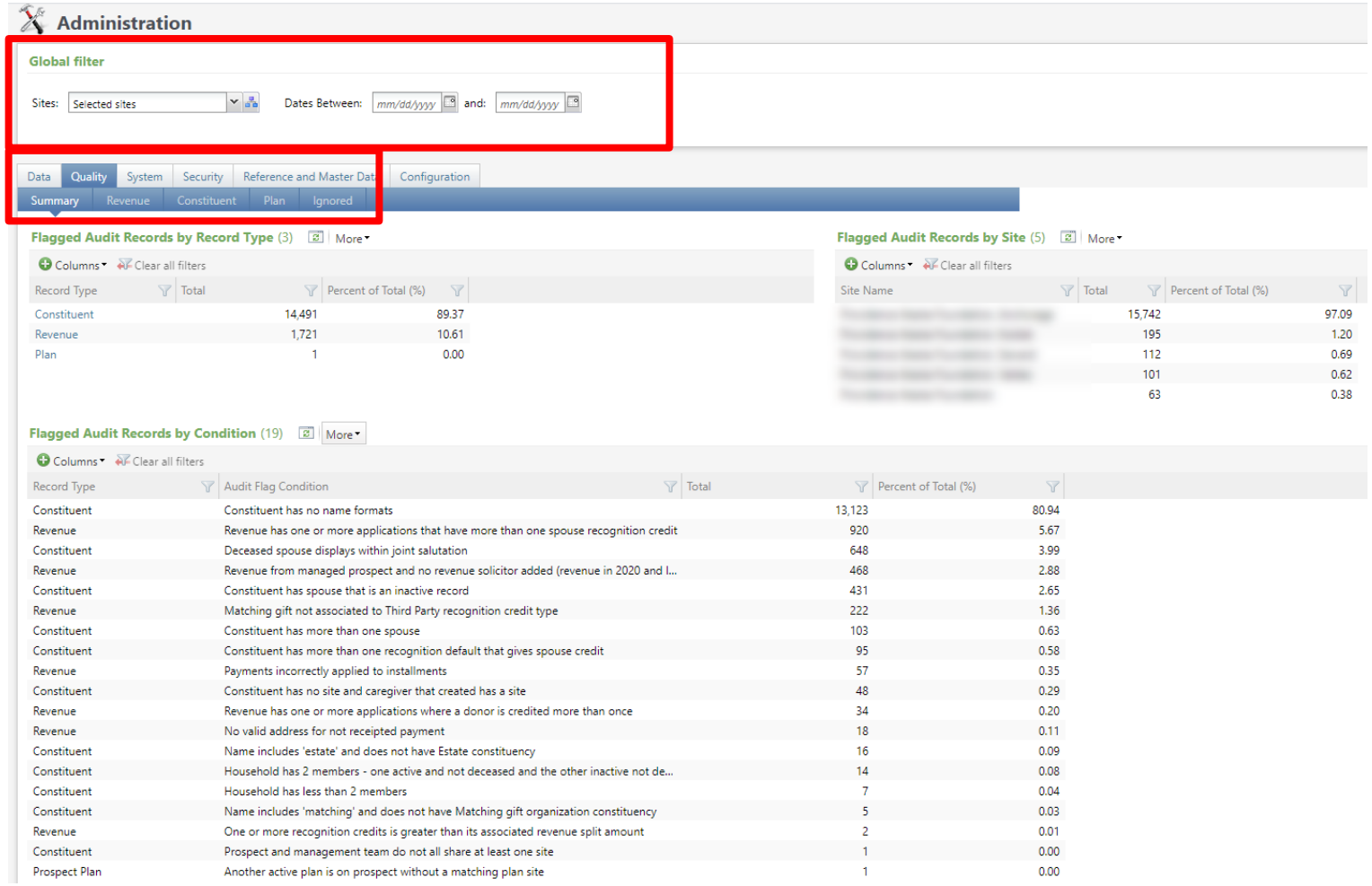
Next: Functional Area Clean-up

- Simplify navigation by removing/tidying functional areas.
- Redesign to follow a similar layout to the Foundation Hub.
- Start with Administration.
  - Least impact to users.
  - Least resistance from users.
  - Prep and tidy other areas by moving configuration and reference data tasks to Administration.

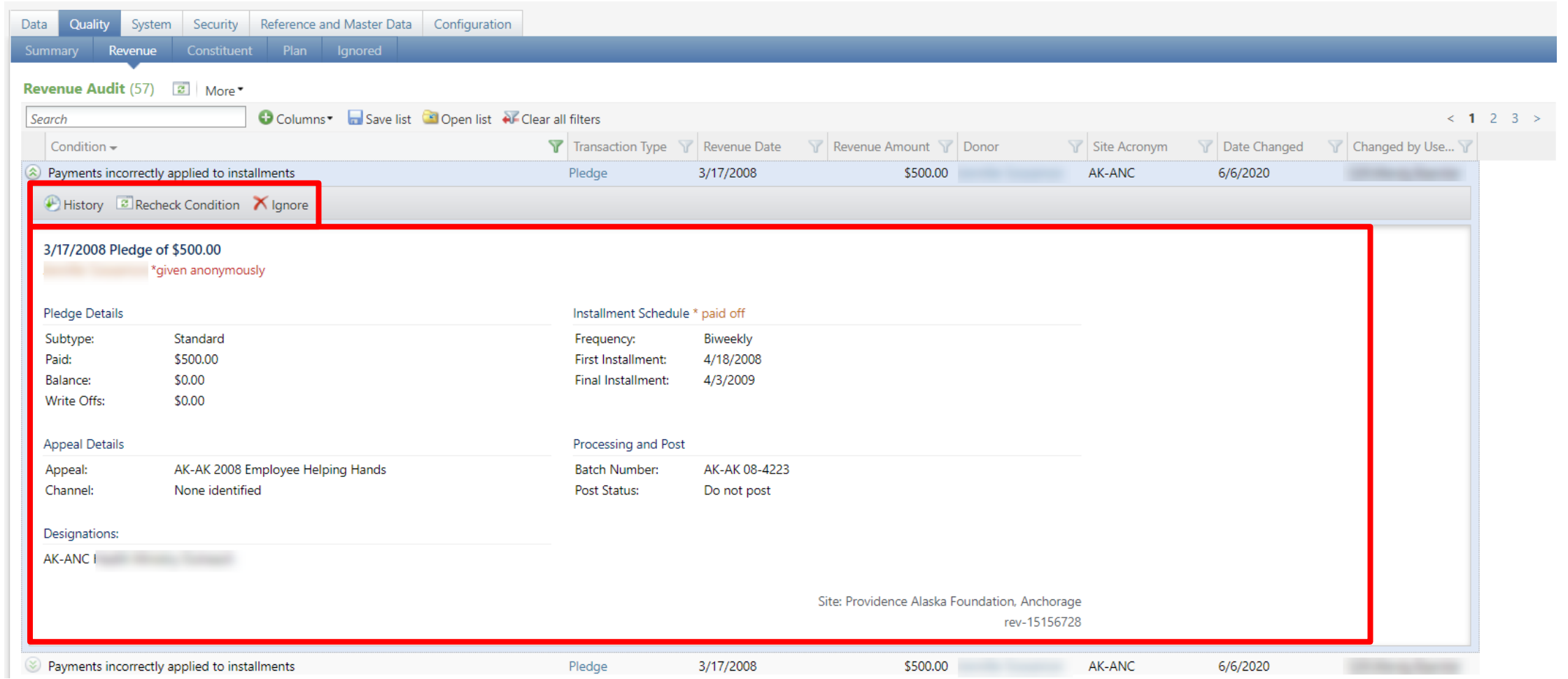
Layout: Administration Functional Area



Layout: Quality



Layout: Data Quality Audits - Details



Reception & Learned

- Users have adopted Administration without reports of confusion.
- Layout has made finding locations for update easier for admin team.
- New quality feature has varying degree of adoption throughout Foundations.

- As new features are added to DREAM, continued upkeep to ensure configuration and reference data links are added to Administration and not other functional areas.
- Already some new features that were introduced to DREAM without this consideration, leading to discrepancy in approach.

Stay Connected

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Thank you!