

Functional Requirements Document- R&D

Prepared for
Technica

Version: **2.0**

Prepared by:
Abdo Khoury

Contributors:
Antonio Saleh

Table of Content

Contents

- INTRODUCTION..... 3
 - 1.1 PURPOSE.....3
 - 1.2 ACRONYMS3
- 1.1 BUSINESS PROCESSES LIST 4
 - 1.2 PROCESSES LIST4
 - 1.3 SALES SUPPORT PROCESSES 5
 - 1.3.1 RD001 – New Engineering Item 6
 - Process Overview6
 - Requirements11
 - 1.3.1 RD002 – Product Lifetime State..... 11
 - Process Overview11
 - 1.3.2 RD003 – Engineering Change Request 12
 - Process Overview12
 - 3. Requirements.....13
 - 1.3.3 RD004 – Engineering Change Order..... 13
 - Process Overview13
 - 4. Requirements.....14
 - 1.3.4 RD000 – Setup..... 14
 - Engineering Product Category14
 - Product Owners.....16
 - Product Attributes.....17

Introduction

1.1 Purpose

The Functional Requirements Document (FRD) describes in common terms:

- An overview of the processes comprising each Work stream
- An overview of each sub-process comprising the Work stream
- Major gaps between the business requirements and the functionality supported by the standard Microsoft Dynamics 365 solution
- The problem summary including current business/environment issues
- Proposed technology to support the new or altered business processes
- How implementation of the proposed solution will benefit the users/stakeholders

The FRD is the starting point of the solution and system development and is a collaborative effort between all business and technology stakeholders. The purpose of the Functional Requirements Document (FRD) is to document requirements for the requested system solution.

The objective of the Functional Requirements Document is to provide enhanced documentation for requirements that are a gap or will require a workaround or process change in order to fit the system solution of the client. The need for any modifications is clarified through the FRD. The FRD forms the basis of the subsequent task concerning the system design.

This document focuses on Production requirements.

1.2 Acronyms

Abbreviation	Explanation
FRD	Functional Requirement Document
System	Dynamics 365 Finance & Operation
D365	Dynamics 365 Finance & Operation
Backoffice	D365 F&O

1.1 Business Processes List

1.2 Processes List

To elaborate and define the functionality, the following processes have been presented in the subsequent sections:

Process ID	Name
RD001	New Engineering Item
RD002	Product Lifetime State
RD003	Engineering Change Request
RD004	Engineering Change Order

1.3 Sales Support Processes

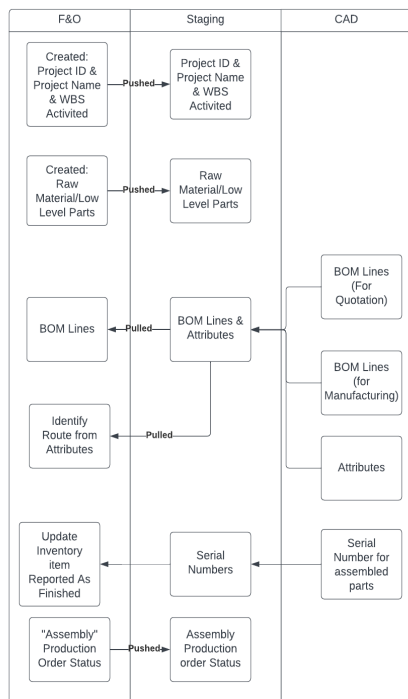
1.3.1 RD001 – Project Management

Process Overview

The R&D manage their work by creating their own projects, these might have efforts and it's own WBS not related to any customer delivery; the R&D will have their own Project Group in order to separate their projects for regular implementation projects.

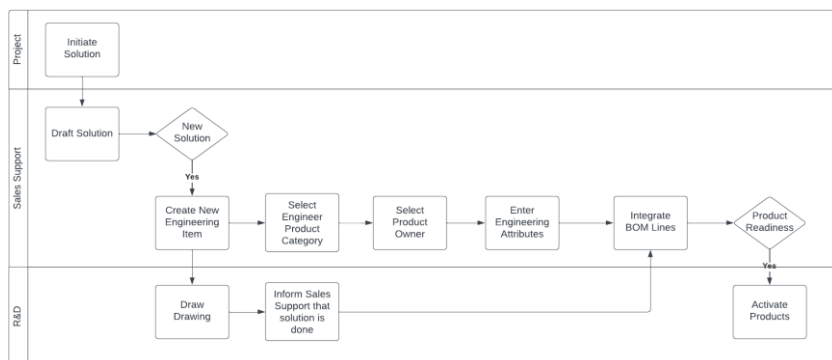
Timesheet will be recorded to track all efforts related to the R&D even before the opportunity is won , R&D will be recording all their efforts through timesheets; the R&D should have a their own section in the opportunity quotation WBS, in order to track all efforts incurred.

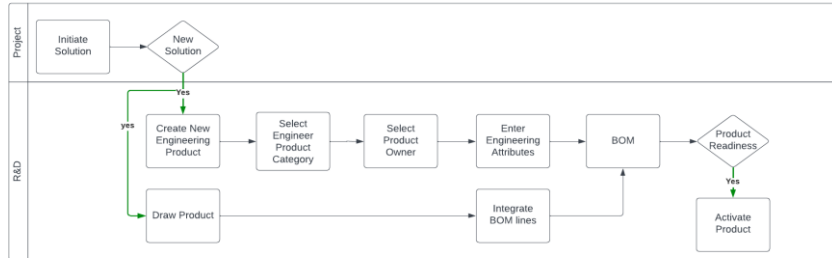
Note that the Engineering Change Management doesn't replace the PDM functionality in CAD, rather to complement it on the ERP side. The below illustration shows the relationship with CAD, but the full details will be in the integration FRD. *All Raw Material/or low level components will be created in F&O and Pushed to CAD, whereas all manufactured items will be will be created in CAD and pushed to F&O.* So product versioning will be pushed from CAD to F&O



1.3.2 RD002 – New Engineering Item

Process Overview





When the project initiates work on a solution, the sales support start working on it, if they use an existing solution, then they have everything they need to proceed otherwise if it is a new solution then they will create a New Engineering Product on which the R&D will continue to work

My view ?

New product

Engineering Product Category

Product owner

IDENTIFICATION

Product number

Version

Configuration

Product name

Search name

Description

OPTIONAL ENGINEERING ATTRIBUTES

Name	Value
Bag type	Satchel
Belt Thickness	3mm
Length	1
Speed	30m/m

1. The Sales support or Marketing might create the Job request in order to request a new solution.
2. The R&D will create a new engineering product based on the Sales support/marketing requirement. *Noting that the same cycle will be used for new requirement related to a solution proposal or project Snags; each of them will have a different process depending on the category chosen (whether Snags or new Solution)*

- a. The first thing they select the **engineering product category (details in A.1)**, the engineering category allows the item to inherit attributes which the user has to fill out when creating an **item**
- b. the sales support can run the engineering attribute search to check if there are any identical items existing in the system

Standard view ▾

Engineering attribute search

Criteria

Select query
Query used ▾ Modify... ▾

Engineering product category de...
Mechanical ▾ Date 7/25/2023

+ Add Remove Search

Name	Range	Alternative units of measur...
Bag type	Satchel	
Belt Thickness	3mm	
Length	1	
Speed	30m/m	

Results

Clear results Engineering versions Released product details

Product number	Product name	Description	Version	Active
6000 : SS : :			V-001	
6001 : SS : :	Red	Red	V-001	
6002 : PS : :	tree		V-001	
6003 : PS : :	blue		V-001	✓
6004 : PS : :			V-001	
AK0001 : PS : :			V-001	

Result count
7

Commented [EA1]: Need to check the cycle between the PDM which is the CAD system where the product is initially created and data entry to ERP.
Will there be any link to prevent data entry duplication. If not, who will create new products on ERP or update data related to existing portfolio?

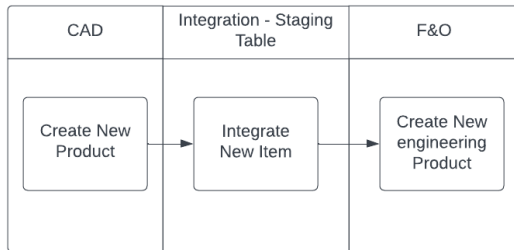
Commented [AK2R1]: To be discussed in the integration session

Commented [RR3R1]: This has to be clear from the beginning as it may require double Engineering work due to some limitations and has to be highlighted from now if any. Based on last integration session, data entry will be done manually which has to be highlighted in terms of risks and future engineering investment.
Should third party solution be adopted from now to prevent rework and integration in the future?

Commented [AK4R1]: To be discussed internally at Technica and Advise Back

3. The R&D in turn will draw their solution and inform the Sales support so they can run the import integration and get the BOM lines.

Option 2: if technica decide to create items in the PDM, then we can decide on a different approach; items can be created in CAD and then integrated into F&O ,



A.1 the Engineering Product Category

Engineering product category details

Name: Engineering organization

Details

DEFAULTS

Product type: **Item**

Production type: **BOM**

Catch Weight: ☐ No ☒ Yes

Product subtype: **Product master**

Product dimension group: **Material**

Configuration technology: **Predefined variant**

Product lifecycle state at creation: **Active**

VERSION

Version number rule: **Default**

RULES

Enforce effectivity: ☒ Yes ☐ No

Attributes

Name	Value	Mandatory	Batch attribute	Inheritance attribute
Bag type	Satchel			
Belt Thickness	3mm			
Length	11			
Speed	30km/h			

Readiness policy

Product readiness policy: **R1**

Release policy

Product release policy:

These categories will be collected from Technica during the setup & migration phase

The Engineering Product category contains the following characteristics:

1. Product Type: ITEM or SERVICE
2. Production Type: ITEM or BOM
3. Product Subtype: Product or Product Master
 - a. If it is Product Master: then the Product Dimension group
4. Version Number Rule: which defines the versioning number sequence
5. Product Lifecycle state:
6. Product Readiness Policy:

The Product Readiness Policy allows Technica to place their own rules as to when an engineering product is fully ready to be released and used, these rules could be making sure cost is set on an item to BOM or Route Check

Product readiness policies

Name: R1

Description: R1

General

Product type: **Item**

Active: ☒ Yes ☐ No

Readiness control

Process area: **Production**

Type: **System check**

Name: **BOM**

Description: **Checks if a BOM exists for the engineering version.**

Add check

Type	Process area	Name	Description
System check	Inventory	Cost price	Checks whether a cost price exists for the released product.
System check	Inventory	Inheritance attributes	Checks if the item has off...
System check	Inventory	Bar codes	Checks whether an item h...
System check	Inventory	Default order settings	Checks if all the default or...
System check	Inventory	GTIN codes	Checks whether an item h...
System check	Inventory	Warehouse items	Checks if a warehouse ite...
System check	Production	BOM	Checks if a BOM exists for...
System check	Production	Released product BOM	Checks if a BOM exists for...
System check	Production	Released product route	Checks if a route exists for...
System check	Production	Engineering version check	Checks if a route exists for...
System check	Purchasing	External item descriptions	Checks whether the purch...
System check	Purchasing	Trade agreements	Checks whether trade agr...
System check	Sales	Commission calculation	Checks if sales commis...
System check	Sales	External item descriptions	Checks whether the sales...
System check	Sales	Trade agreements	Checks whether trade agr...

Commented [EA5]: Is the Version # coming from the standard Library (design version available in Library?) or it is related to the product usage in ERP? How this data entry will take place during creation/ update for new product?

Commented [AK6R5]: To be discussed in the integration session

Commented [RR7R5]: Need to make sure there is a link to the cad version in Standard Library. Scope and deliverables for the whole cycle are still not clear to me in terms of connectivity and tasks automation.

Commented [AK8R5]: To be discussed internally at Technica and Advise Back

Once the rules are set, the R&D product owner can run the readiness check to make sure the engineering product passes and can be used.

6002 : TREE | Standard view

Readiness checks

Type	Process area	Name	Status	Approved	Mandatory	Questionnaire	Owner type	Owner
System check	Costing	Cost prices	Passed	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Person	Brad Sutton

Notes

History

Applied action	Log	Action applied by	Action applied at
Validated	Check failed on 6/19/2023 09:10:26 pm	akhoury	6/19/2023 9:10:26 PM
Validated	Check validation passed. Executed by user akhoury on 6/19/2023 9:11:07 PM	akhoury	6/19/2023 9:11:07 PM
Marked completed	Check completed by akhoury on 6/19/2023 09:11:07 pm	akhoury	6/19/2023 9:11:07 PM

Commented [EA9]: Need to check in which environment the R&D eng. Will be updating these data....normally all should be done on PDM level and synchronized with ERP system not to duplicate and add risk on data entry... a wider view here is required to set the final expectations.

Commented [AK10R9]: Noted, Please advise

Commented [AK11R9]: To be discussed in the integration session

Commented [RR12R9]: From my perspective, R&D engineer should not have to work on ERP system to enter or update product data. If this is the case, need to discuss effect on time investment and work efficiency on long term.

Commented [AK13R9]: To be discussed internally at Technica and Advise Back

Requirements

ID	Description	Fit/Gap
SS002-01	Ability to track DFI	GAP - Customization
SS002-02	Ability to maintain several configuration on the same product while maintaining the legacy solution	FIT
SS002-03	Track each BOM version separately with Cost	FIT

1.3.3 RD003 – Product Lifetime State

Process Overview

R&D need to control the Product lifecycle state so they can set an item as Active, Discontinued or any other custom state they might need. Changing a engineering product state can either occur manually or through a engineering product change order.

Commented [EA14]: Same as above... R&D Engineer should not be handling this data entry in two separate environments. If Dynamics will be providing the full PDM functionality or we need to split. In this case how to make sure product data and versions on ERP are updated continuously and synchronized with external Library.

Commented [AK15R14]: To be discussed in the integration session

Commented [RR16R14]: Same as above... link between the ERP and CAD environment is still not clear

Commented [AK17R14]: To be discussed internally at Technica and Advise Back

2. Once approved, an engineering change order can be created from the engineering change request

3. Requirements

ID	Description	Fit/Gap
RD003-01	R&D's Trigger to initiate work based on new requirement will be handled by the Engineering Change Request issued by Sales Support	FIT
RD003-02	Change request can be initiated by Business Development or Sales	FIT
RD003-03	Ability to apply Change Request Workflow	FIT
RD003-04	Ability for R&D to track Engineering change request stages	FIT
RD003-05	Change Request needs to have a deadline	GAP
RD003-06	Engineering change request should be approved by the Mechanical or electrical HOD depending on the change or enhancement to a particular	FIT

Above section is repetitive from sales support document.

1.3.5 RD005 – Engineering Change Order

Process Overview

When the engineering change order is created from the engineering change request, it will be populated with all the information for the change in question, which can either be from DFI or from the engineering change request itself. In the Change order the R&D can add the changes that is needed to happen whether it is a creating a new Engineering product or updating a previous items, or updating an item to state to Discontinued. *Moreover each of the change order types can follow a separate workflow process.*

Save + New Delete Change order Options

Maintain Change status References Severity Where-used Business Impact Product releases View

Validate Open Complete Approve Cancel Engineering change requests Engineering change requests Project details Calculate Search Search View Search View Process Release product structure Log Engineering change order report

Engineering change orders | Standard view

Engineering change order 000002

Engineering change order

IDENTIFICATION STATUS Category Priority PROCESS STATUS

Change order 000002 Status Open Mechanica 8 Products processed No

Title yes Severity

Processed by

Processed at

Impacted Products

+ New Remove Products Where-used Business impact Originating references Target References Preview Apply attribute rules

Change type	Item number	Product	Product name	Current version	Impact	Engineering controlled
New	6005		Yes		New product	<input type="checkbox"/>

Product details

Details Item details Attributes Documents Bill of material Formula Route Change information

PRODUCT

Product Engineering product category de Mechanical Product lifecycle state Active

Product owner Mechanical

Effective from 6/19/2023

Effective to

NAMING

Product name Yes

Search name Yes

Description

IMPACT

Impact New product

New item number 6005

New version

4. Requirements

ID	Description	Fit/Gap
RD004-01	Final Decision to proceed with Engineering change order needs to be approved by R&D HOD	FIT
RD004-02	Add the PLC , HMI and other documentation to Engineering Version as URL	FIT
RD004-03	Ability to apply Change Order Workflow	FIT
RD004-04	Feedback on certain machine come in form of SNAGS	FIT
RD004-05	Track Change order due date	GAP
RD004-06	New Changes to product that didn't exist	FIT
RD004-07	Changes to Existing product	FIT

1.3.6 RD000 – Setup

Engineering Product Category

The Engineering Product category allows Technica to group their products in engineering categories that would allow them to better manage their engineering products.

Engineering product category details

Name: Electrical Engineering organization: Eng

Details

DEFAULTS

Product type: Bag

Product subtype: **Product master**

Production type: **ISOM**

Catch Weight: ☒ No

Product dimension group: [Size/Col/Can](#)

Configuration technology: [Predefined variant](#)

Product lifecycle state at creation: [Default](#)

VERSION

Version number rule: [Default](#)

RULES

Enforce effectivity: ☒ Yes

NOMENCLATURE

Use number rule nomenclature: ☒ No

Use name rule nomenclature: ☒ No

Use description rule nomenclature: ☒ No

Attributes

+ Add Remove Update existing products Up Down

Name	Value	Mandatory	Batch attr...	Inheritanc...
Bag type	Satchel			
Belt Thickness	3mm			
Color				
Length	1			
Speed	30m/m			

Technica will provide all Engineering Product Categories during the migration phase

During the analysis phase Technica shared the following:

- Packer
- Palletizer
- Elevator
- Transfer Car

Each of these categories will have their own unique attributes to track

							Primary product						Package						Head weight kg		
							Diameter/width mm		Length mm		Height mm				Diameter/width mm		Length mm			Height mm	
Equipment	Type	Technology	Index	Identification code	Product	picking tool type	Product material	min	max	min	max	min	max	Package type	Package material	min	max	min	max	min	max
Packer	Conventional	Cartesian	KPC	KPC01	round bottles	endblock	PET	70	110	-	-	50	300	crate	plastic	200	350	300	200	500	30
Packer	Conventional	Cartesian	KPC	KPC02	round bottles	vacuum	PET	50	70	-	-	50	200	crate	plastic	200	350	300	200	500	30
Packer	Conventional	Cartesian	KPC	KPC03	Galsons	endblock	HDPE	50	140	50	220	50	300	crate	plastic	200	350	300	500	200	500
Packer	Conventional	Cartesian	KPC	KPC04	buckets	vacuum	plastic	90	200	-	-	80	250	crate	plastic	200	350	300	200	500	30
Packer	Conventional	Cartesian	KPC	KPC05	bars	magnet	plastic	50	150	-	-	50	240	crate	plastic	200	350	300	500	200	500
Packer	Conventional	Cartesian	KPC	KPC06	posts	mechanical	plastic	80	120	-	-	50	150	crate	plastic	200	350	300	500	200	500
Packer	Conventional	Cartesian	KPC	KPC07	ports with lid	vacuum	plastic	80	120	-	-	50	150	crate	plastic	200	350	300	500	200	500
Packer	Conventional	Cartesian	KPC	KPC08	tubs	vacuum	plastic	80	120	100	150	50	150	crate	plastic	200	350	300	500	200	500
Packer	Robotic	2D robot (Technical)	KRT	KRT01	round bottles	endblock	PET	70	110	-	-	50	300	crate	plastic	200	350	300	200	500	30
Packer	Robotic	2D robot (Technical)	KRT	KRT02	round bottles	vacuum	PET	50	70	-	-	50	200	crate	plastic	200	350	300	200	500	30
Packer	Robotic	2D robot (Technical)	KRT	KRT03	Galsons	endblock	HDPE	50	140	50	220	50	300	crate	plastic	200	350	300	500	200	500
Packer	Robotic	2D robot (Technical)	KRT	KRT04	buckets	vacuum	plastic	90	200	-	-	80	250	crate	plastic	200	350	300	200	500	30

So when a new engineering product is created it is going to be assigned to a product category which will inherit all assigned engineering attributes mentioned in the excel sheet

My view ▾

New product

Engineering Product Category

Mechanical ▾

Product owner

Mechanical ▾

IDENTIFICATION

Product number

VPV001

Version

V-001

Configuration

PS ▾

Product name

High Speed Conveyor

Search name

High Speed Conveyor

Description

High Speed Conveyor

OPTIONAL ENGINEERING ATTRIBUTES

Name	Value	
Bag type	Satchel ▾	
Belt Thickness	3mm	
Length	1	
Speed	30m/m	

OK

Cancel

Product Owners

~~Product owners allow Technica to assign ownership to different items to different people~~ The product owner comprises a set of users accountable for particular products. Upon assigning a product owner group to a specific product, only the members within that group hold the authority to release the said product. Additionally, the product owner can be involved in the approval process within engineering change management workflows.

Save

New

Delete

Options

Filter

Mechanical

Eng

Standard view

Product owners

Product owner

Mechanical

Name

Mechanical

Members

+ Add

Remove

Worker

Jodi Christiansen

Charlie Carson

Ted Howard

Technica will provide them during the migration phase.

In some cases, choosing a product owner, might not be possible due to early development stage of the item yet, there needs to be a generic product owner (such as "department") selected, later to be changed whenever the item requirement becomes clear by doing an engineering change order (discussed in Section RD004).

Product Attributes

~~Product owners allow Technica to assign ownership to different items to different people~~

Engineering attributes, serve to specify the particulars that need to be upheld for your products, such as brand, manufacturer, model, or more technical attrbitues such as Belt Size, Motor Speed and many other.

Attributes

+ Add

Remove

Update existing products

Up

Down

Name	Value	Mandatory	Batch attribute	Inheritance attribute
Bag type	Satchel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Belt Thickness	3mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Length	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Speed	30m/m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additionally, these attributes enable your organization to include supplementary details that may be relevant to specific products or category of products. By associating product

attributes with a product, you can efficiently categorize the product based on the attributes it possesses.

Product Variant

Product variants are derived from product masters. They enable the creation of diverse product variations without the need to manage multiple individual products separately. For instance, a product master could be a specific t-shirt, and its variants would consist of different sizes and colors available for that t-shirt.

DOCUMENT APPROVALS

I have reviewed the information contained in this document and approved it through by sign off below:

Name	Department	Date	Signature

Comments:

The specifications and conditions are hereby accepted. Info-Sys is authorized to execute the project as outlined in this document. This document is not valid until signed by the customer representative and returned to Info-Sys.

Signature: _____ Date: _____