PRODUCT CONFIGURATOR

User Manual

Overview

A Product Configurator provides a method of producing unique product configurations based on customer specifications and pre-engineered sets of options and rules. This provides sales staff with an elegant and easy-to-use product configurator and a product engineer with a wealth of powerful and sophisticated tools to define the configuration process.

Product Configurator not only allows for easy selection of features and options but can also perform calculations and present specific choices based on parameters such as dimensions of a door opening entered by the user. Thus, when certain options are selected, additional or alternate options may be presented based on the engineering-defined rules and previously entered data.

E.g. Selecting a specified computer case may prevent accommodation of more than two expansion slots. As soon as the user selects the case type, the configurator calculates that only limited options are available with that case. The user is then presented with only those options, such as the choice of one or two expansion slots. This rigorous rule enforcement assures the customer as well as the production line that the product ordered is one that can be built as per the configuration.

Any manufacturing company that assembles or builds a standard product according to customer specifications (such as size, color, optional features, etc.) is a good candidate for Product Configurator. Product Configurator is an advanced 'rule-based' software application that makes or assembles unique products to customer specifications.

Product Configurator – A Technology

Product Configurator allows a manufacturer to translate product engineering knowledge into rules that define relationships among product options, materials, and manufacturing processes. The collections of rules that relate to a specific product constitute a product Model. Once these Models are defined, even less experienced users can configure complex products. Configurations can be generated through engineering function, quoting function, or directly in sales order entry complete with costs and pricing. During the configuration process, pre-defined rules called Configuration Parameters are used to govern and guide the entry process and to prevent invalid combinations of options.

Overall features and capabilities include:

- Configured products are defined using a consolidated, integrated configuration management tool
- A friendly and elegant product configurator guides the operator through pre-defined option and quantity selections.
- A shorthand configuration entry code is supported that allows the experienced operator to select or enter a configuration in a fraction of the normal time.
- The configuration process checks the configuration and if found new then creates a unique item, bill of material.

- A set of unique costs and catalogue prices is created for each configuration. Descriptive information is also produced.
- Powerful functionalities for configuration rules define: o Product model o Product assembly
  o Configuration parameters & Options of parameter
  o Parameter dependency o Rate & discount policy definition
- Product configurator is tightly integrated with Sales quotation and Sales order Process

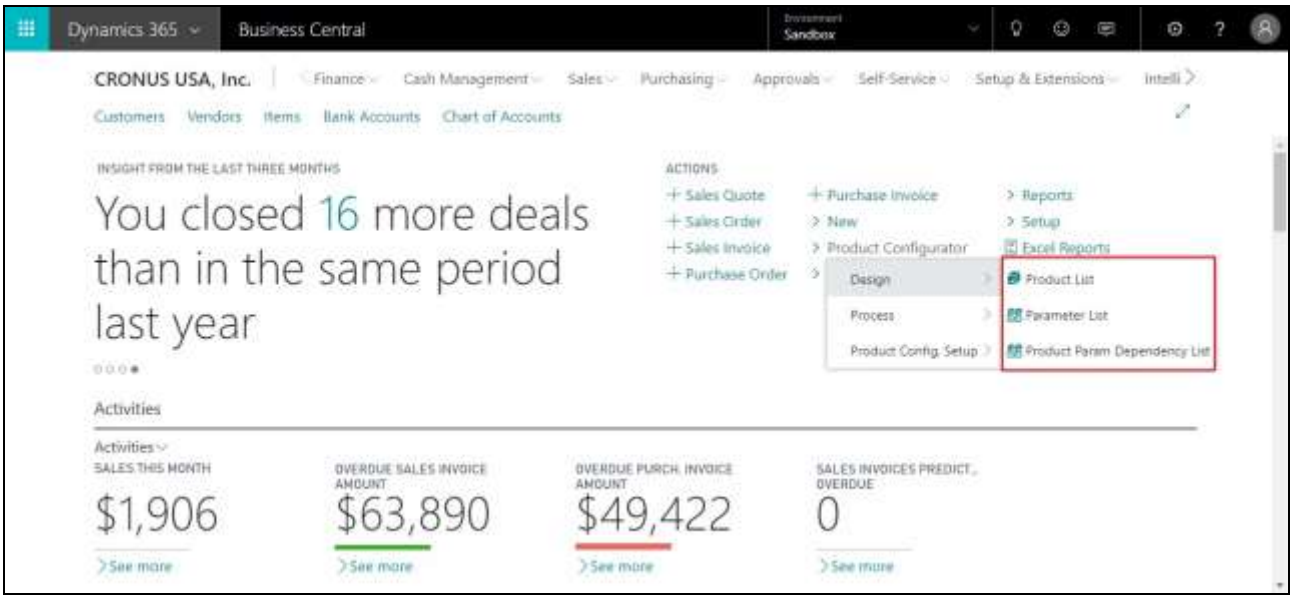
Model Overview

Product configuration is an activity of customizing a product to meet the needs of a customer. With the help of this tool, a sales person can give exact quotation of customized product at a time without any help of engineering or other department. Also, he can check whether the customer's requirements are feasible or not.

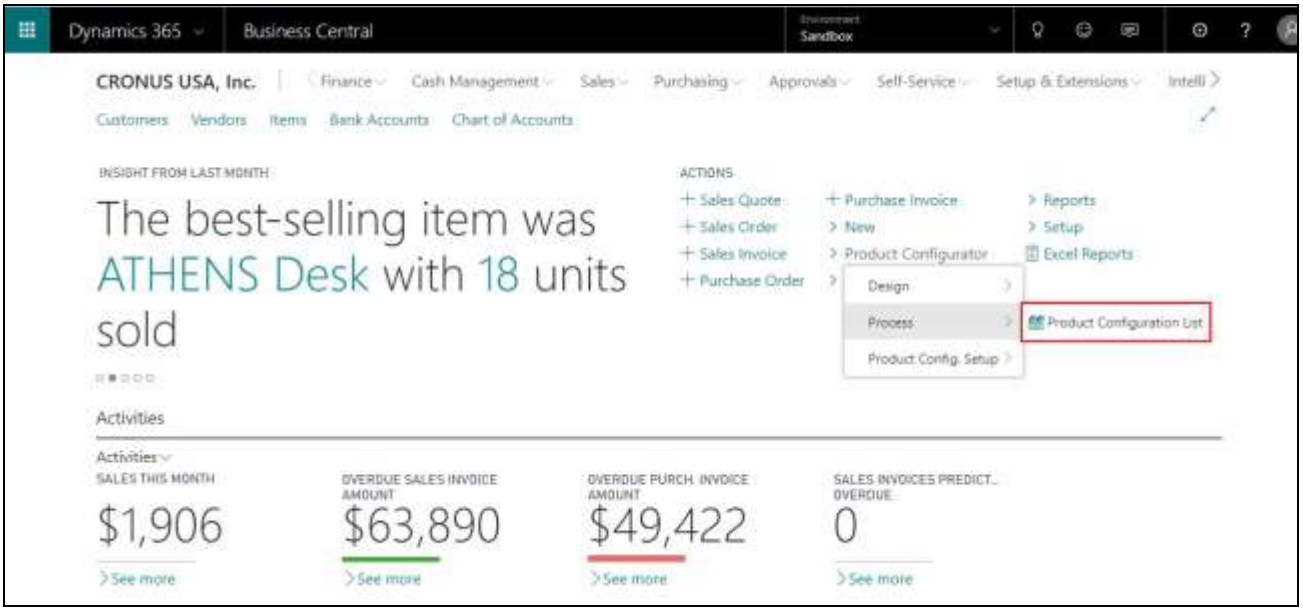
Product configurators represent one of the most successful applications of artificial intelligence principles. The use of product configurators has resulted in many positive effects such as reduced lead times, fewer errors, shorter learning periods for new employees, etc. in engineering-oriented companies.

Product Configurator – Functions & Features

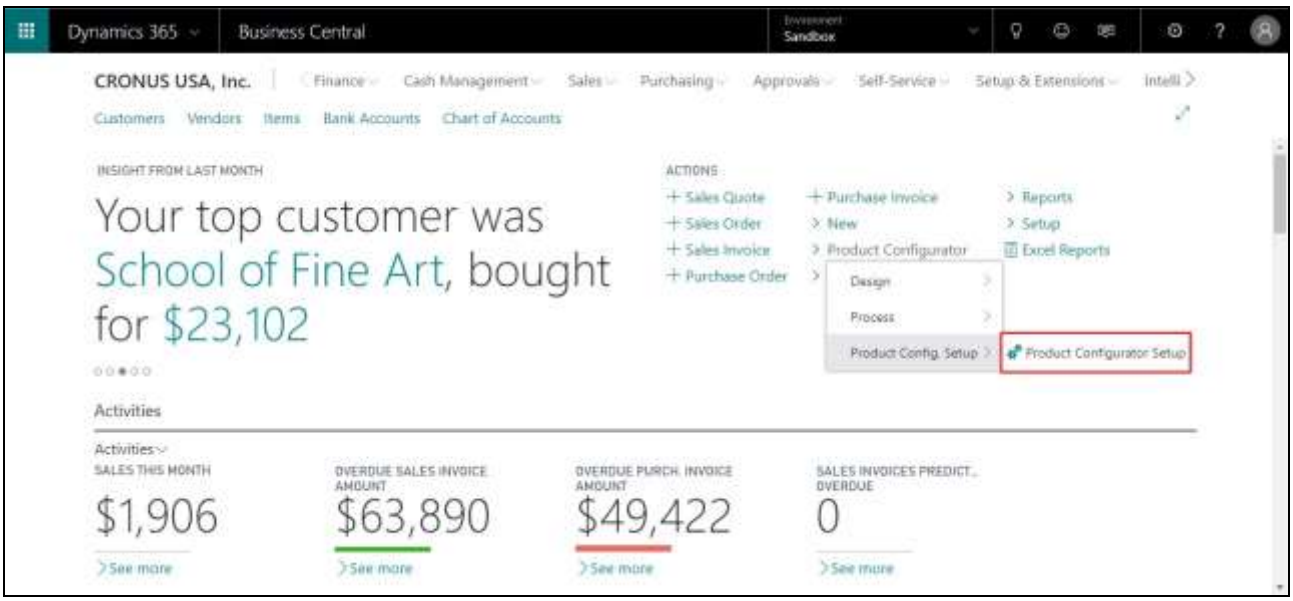
Screen Shot 1



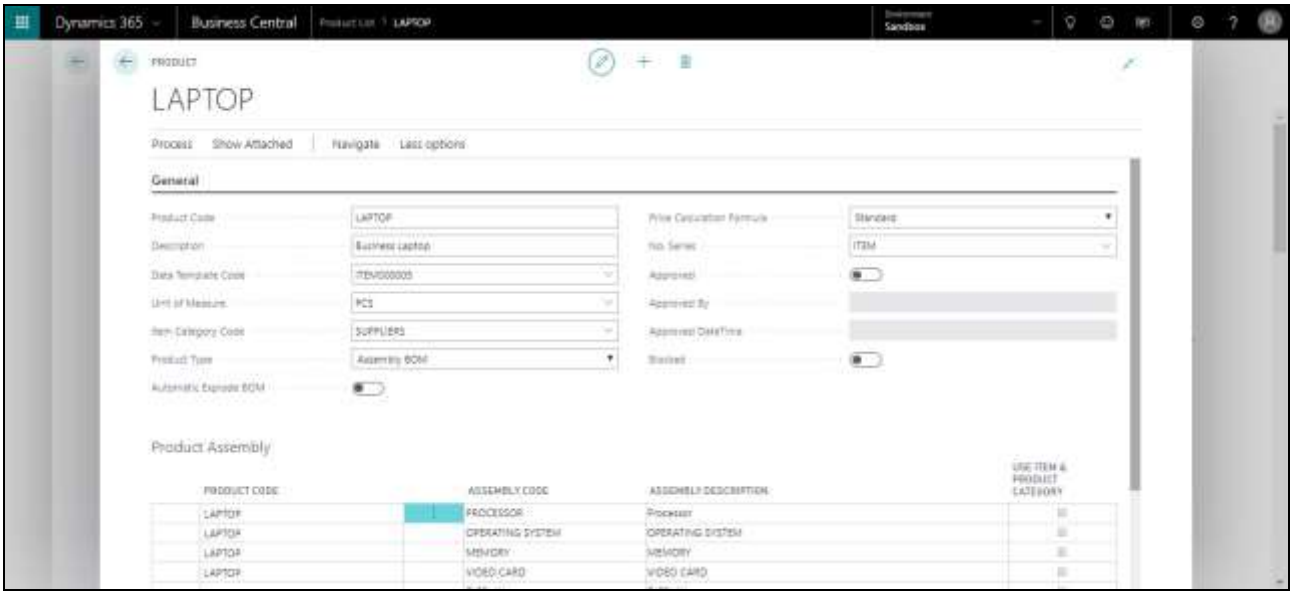
Screen Shot 2



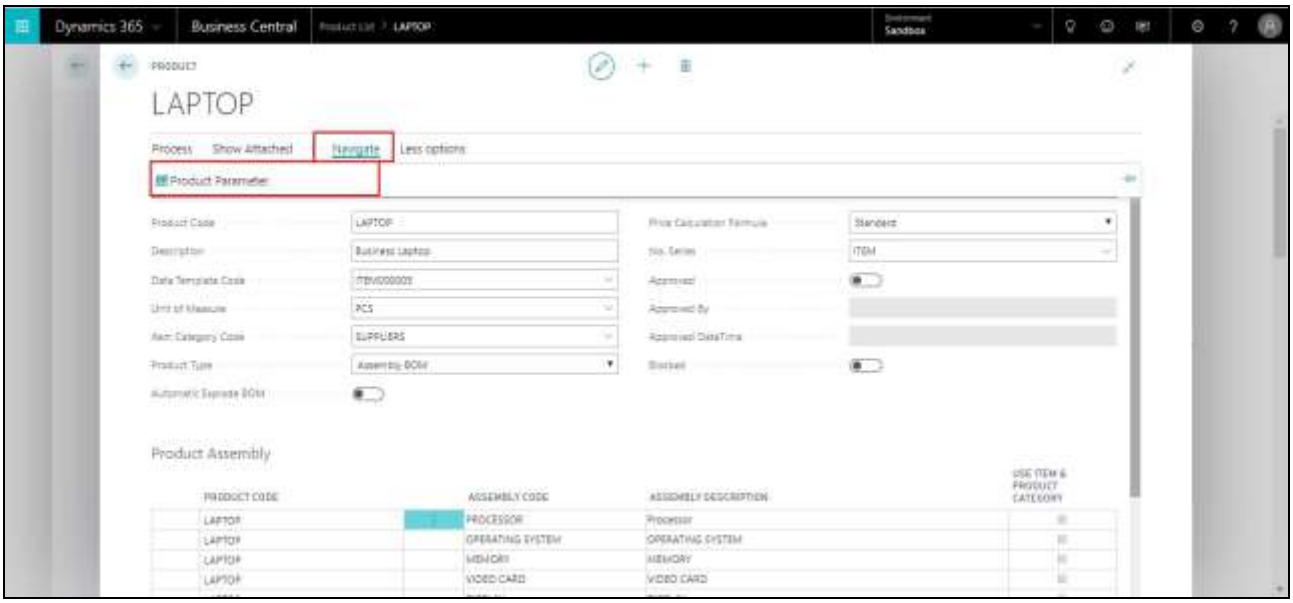
Screen Shot 3

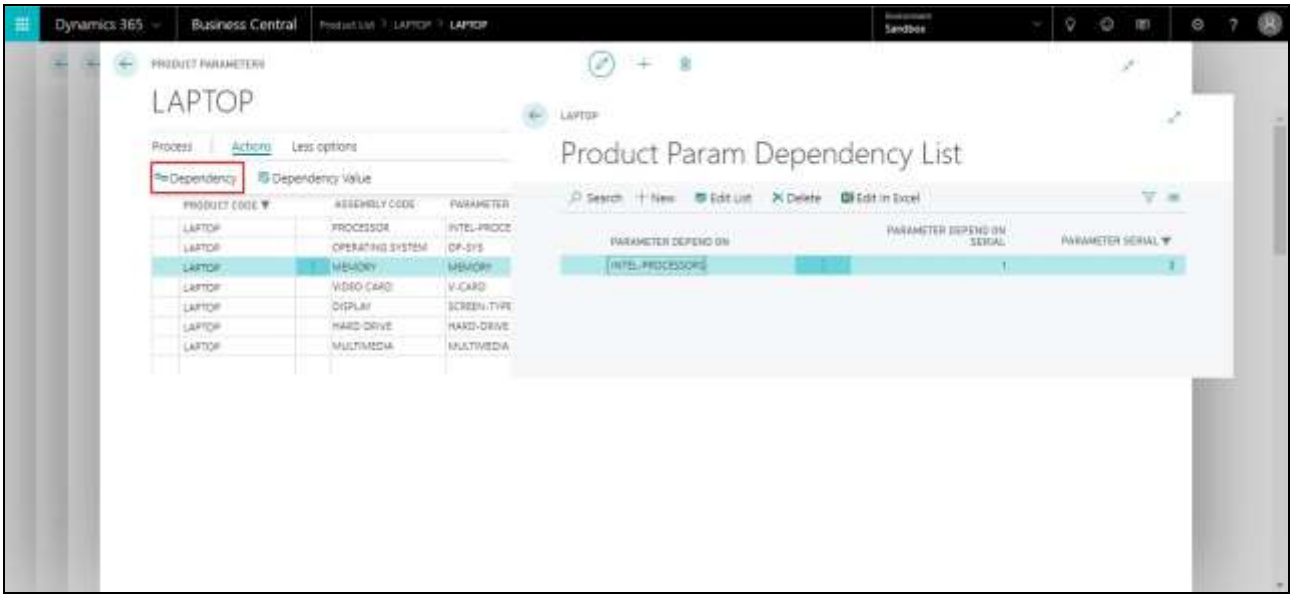


Product List:



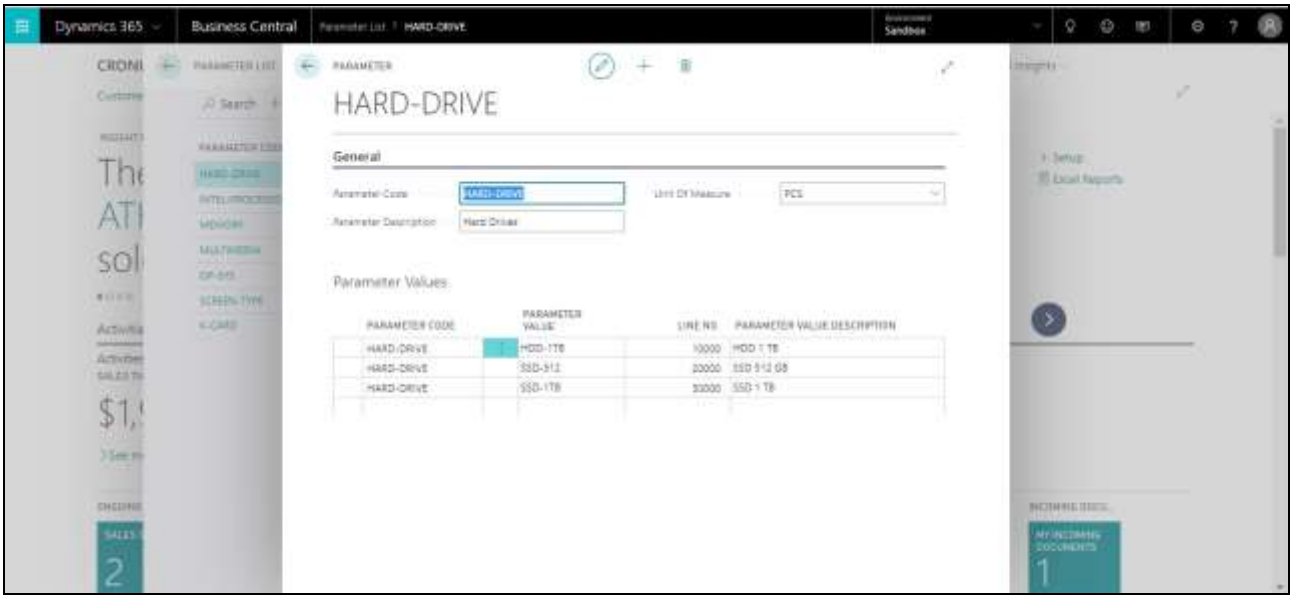
In Product master, you can define your product models with major assemblies which require configuration to build a product.





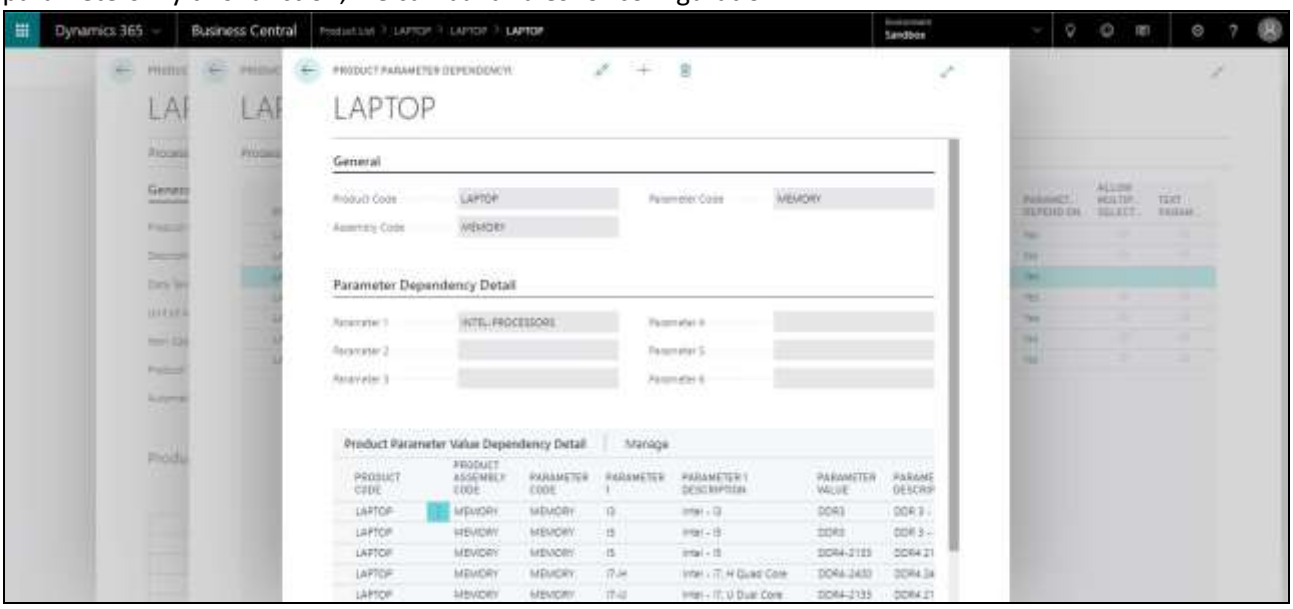
Product Parameter

Product parameters are configurable values of product. In this function, you can define parameter and its related values. E.g. Parameter is Hard Drive and values can be HDD-1TB, SSD-512etc.



Product Parameter Dependency:

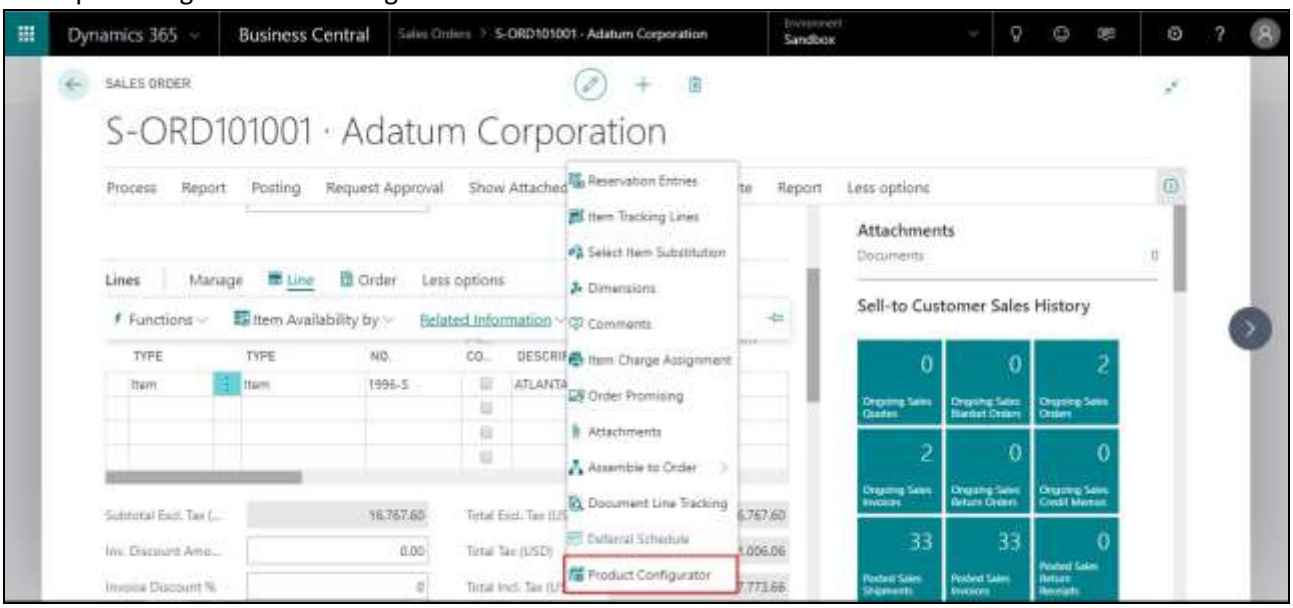
Once product assembly and parameter value are defined, you can create value dependency between parameters. By this function, we can build rules for configuration



Product Configuration:

Integration with Sales Functions:

Product Configurator is also integrated with Sales functions like sales quotation and sales order to minimise order promising time and costing.

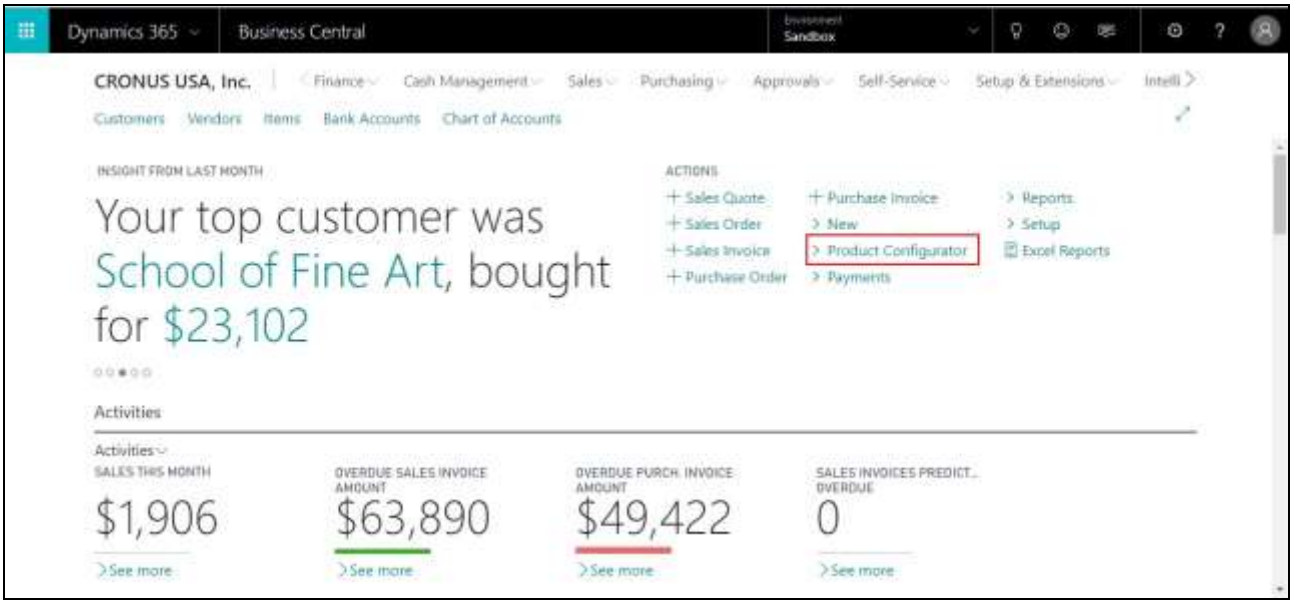


How to use this solution

To leverage benefit from this solution, please follow below procedure.

- Download Product Configurator from AppSource.
- Import Product Configurator in your Dynamics 365 – Business Central instance.
- On Dynamics 365 Business Central mobile and tablet app, navigate to Home as shown in below screen.
- The main menu for the Product Configurator is shown marked in the Red Box in below Screen Shot.

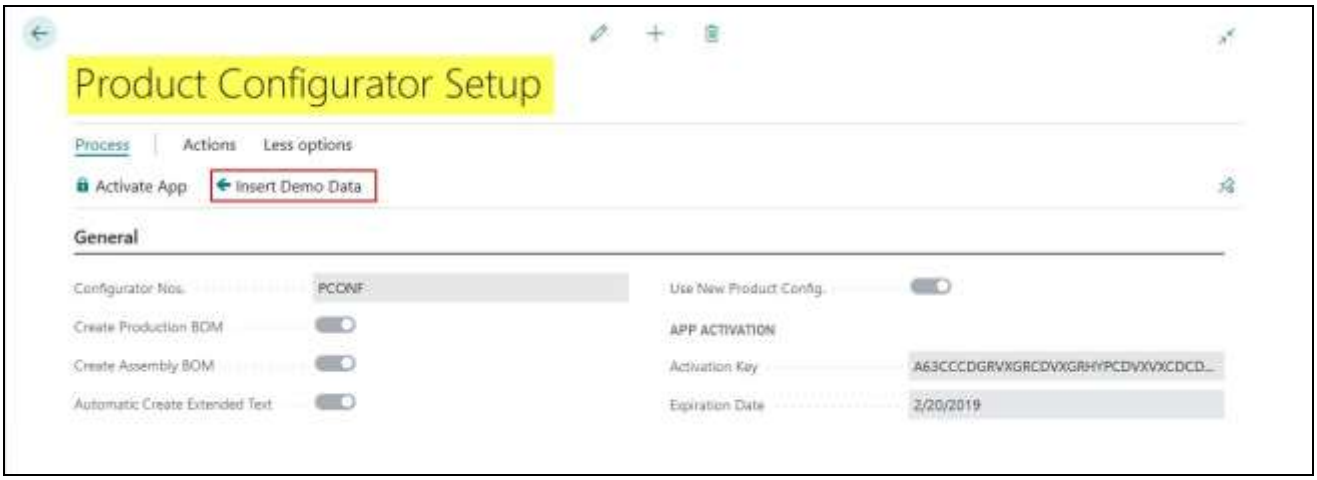
Screen Shot



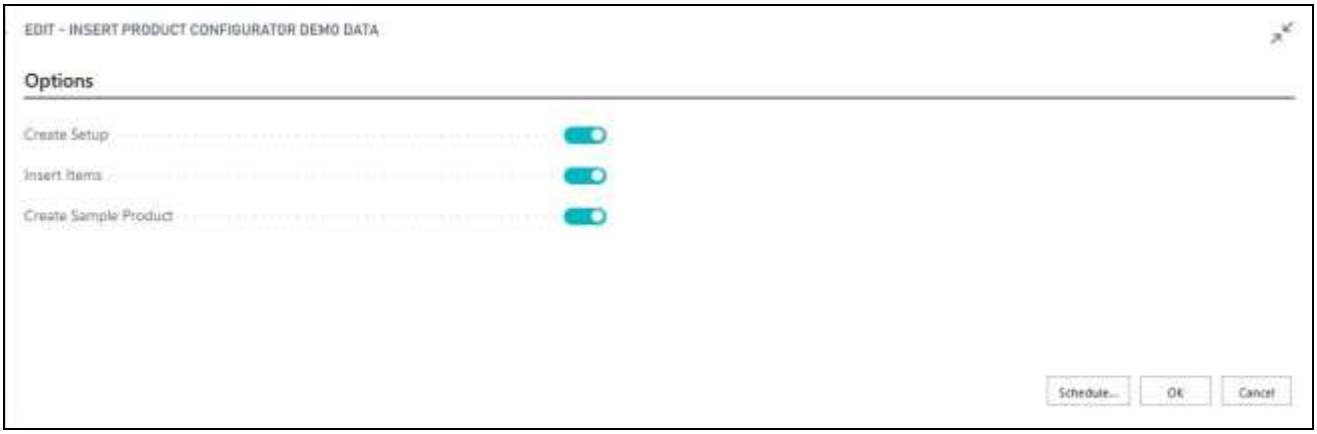
Insert Demo Data

If you want to generate the sample data automatically, navigate to the “Product Configurator Setup” page to import the Demo Data for the extension. (Otherwise follow the manual steps shown from the next page)

Selecting “Insert Demo Data” will open a request page by using which the User can inport data by selecting the check boxes.



User have options to Create Setup, Create Items and Sample Product separately.



NOTE: Once the above process is completed, user can skip points listed below and go to the step: Use Product Configurator.

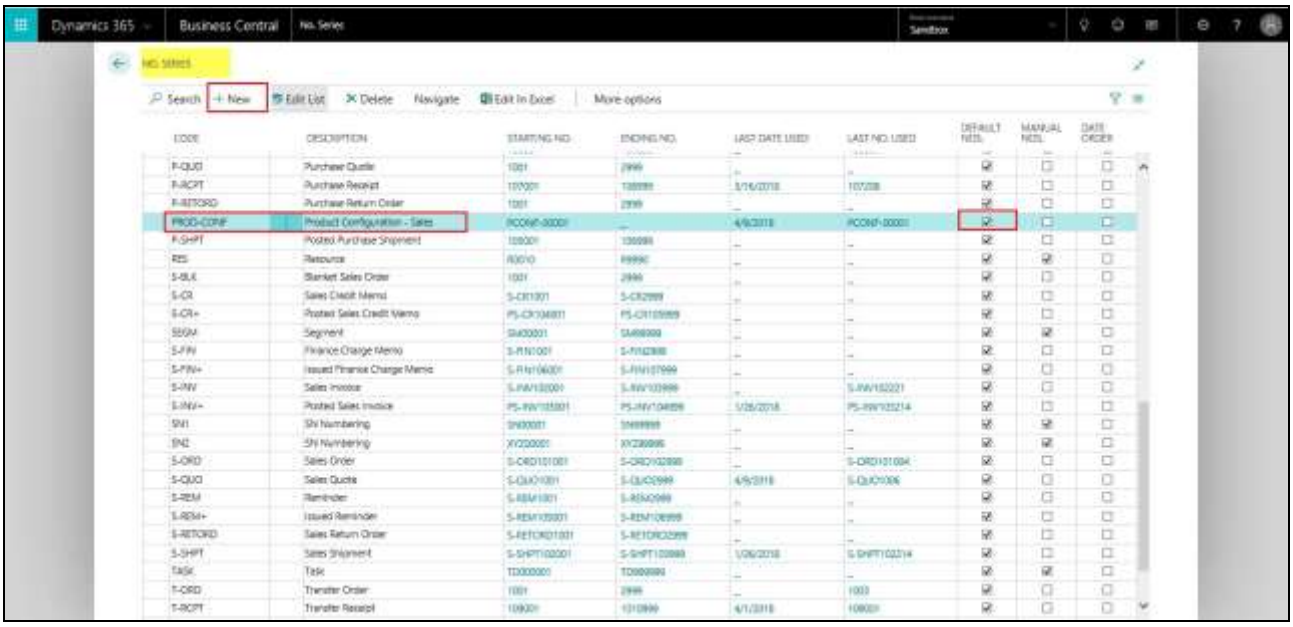
Product Configurator Setup

Navigate to the Setup page to fill up the No. Series for the Product Configurator and set the other Flags as per the requirement.

Start by creating a new No. Series for the Product Configurator.

Search for “No. Series” in Business Central and Click New. Fill up the data as shown in Red Box Below.

Screen Shot

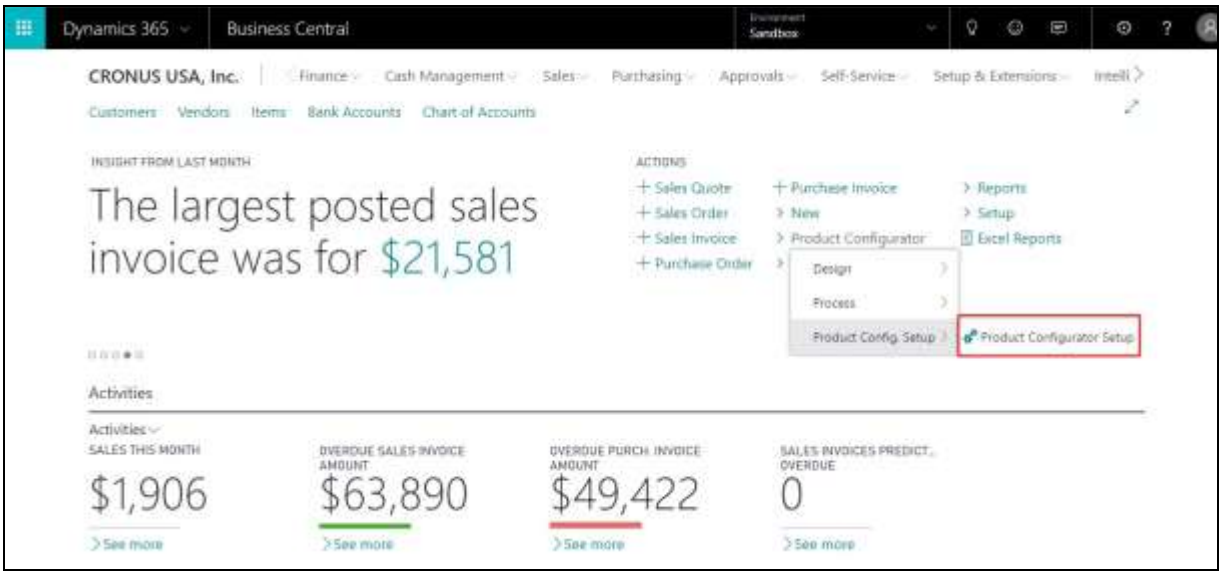


Now, Selecting the newly created ‘PROD-CONF’ , go to Navigate -> Lines

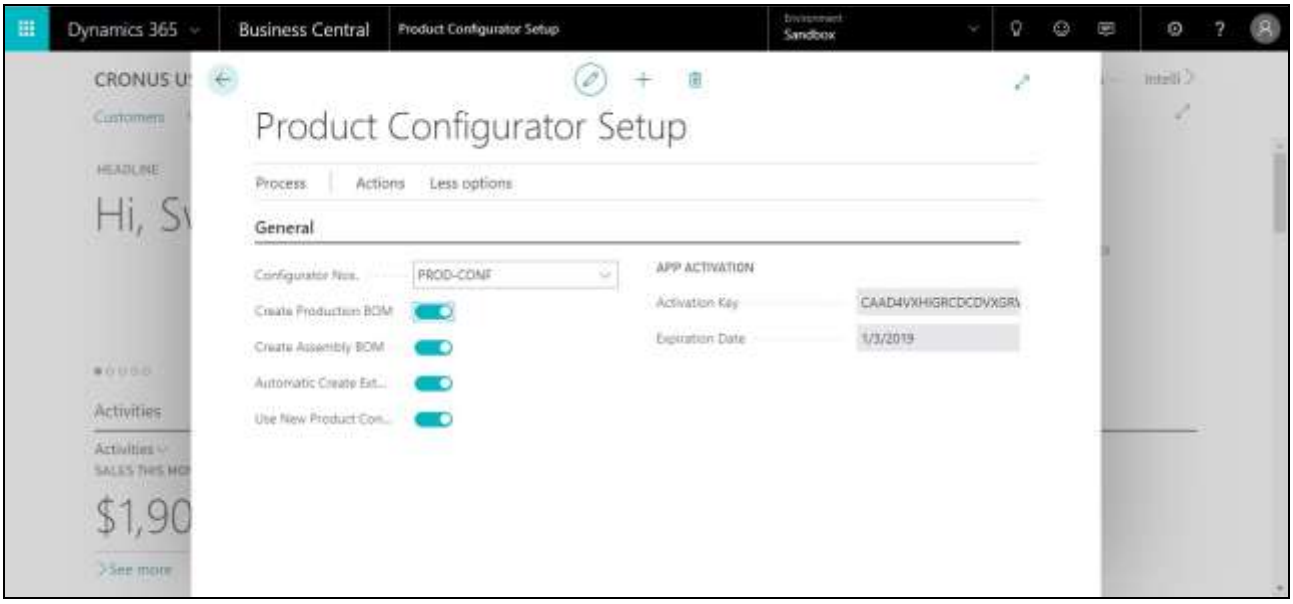
Fill up the Details as shown in Below image.

Close the pages and go to Home -> Product Configurator.

Screen Shot 1



Screen Shot 2



Field	Description
Configuration Nos.	Specifies the code for the number series that will be used to assign numbers to product configurator.
Create Production BOM	Set to TRUE if you want to create Production BOM by system at the time of Item code generation by Product Configurator.
Create Assembly BOM	Set to TRUE if you want to create Assembly BOM by system at the time of Item code generation by Product Configurator.
Automatic Create Extended Text	Set to TRUE if you want to create the extended text of item's description automatically.
Use New Product Config.	Specifies whether to use the new product configurator or not.
Activation Key	Auto generated activation key when the App is installed.
Expiration Date	Specifies the expiration date of the app.

Design

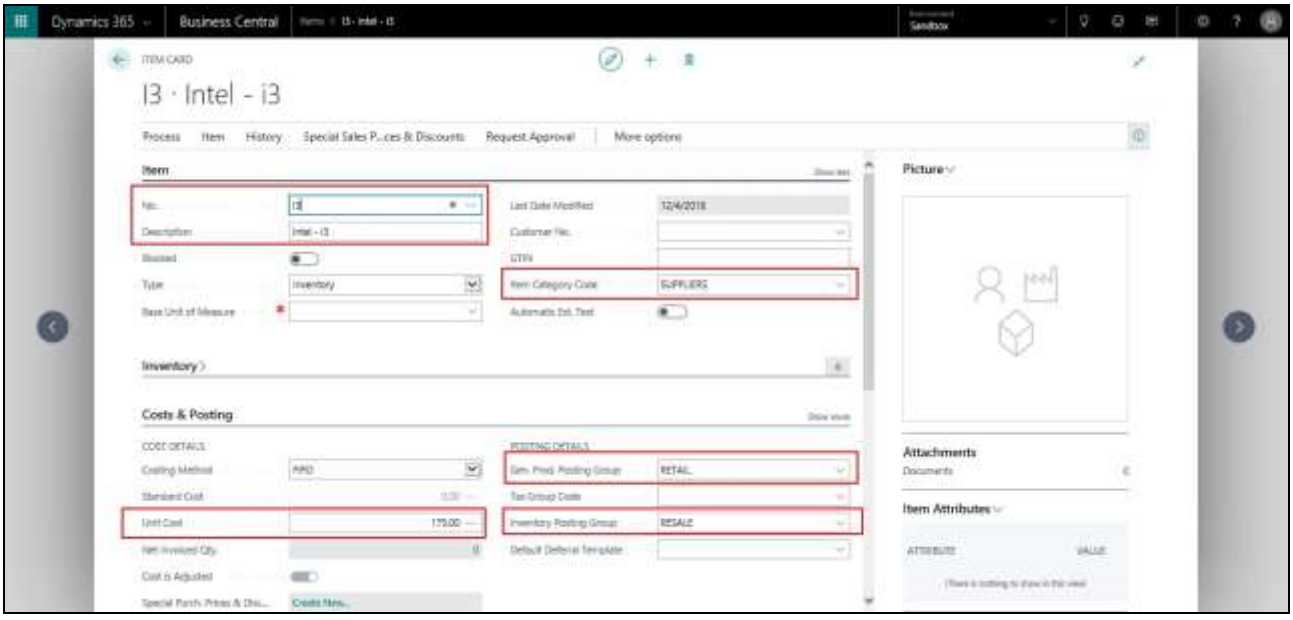
We will learn this topic by taking an example of selling a laptop. Our company manufactures the following items:

Sr. No.	Parameter	Parameter Values
1	Processor	I3, I5, I7-H, I7-U
2	Screen Type	156-FHD, 156-HD, 16-FHD, 16-HD
3	Memory	DDR3, DDR4-2133, DDR4-2400
4	Hard Drive	HDD-1TB, SSD-1TB, SSD-512
5	Graphics Card	G-620, G-630, NVIDIA-930
6	Operating System	NK-64-16, UB-16, W10-64-H, W10-64-P
7	Multimedia	HD-SPEAKER, DOLBY-SPEAKER

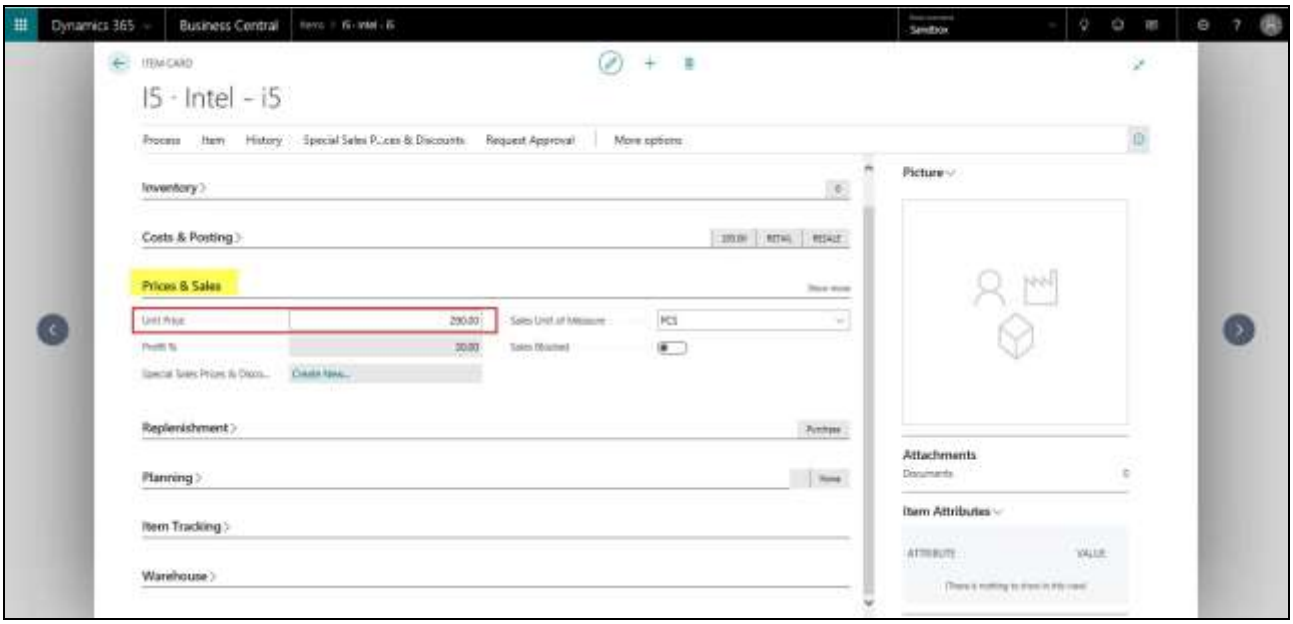
Items:

Create all the Item which will are available as a Parameter Value for the Product Configurator. Create all the items as shown in below Screen Shots.

Screen Shot1



Screen Shot 2



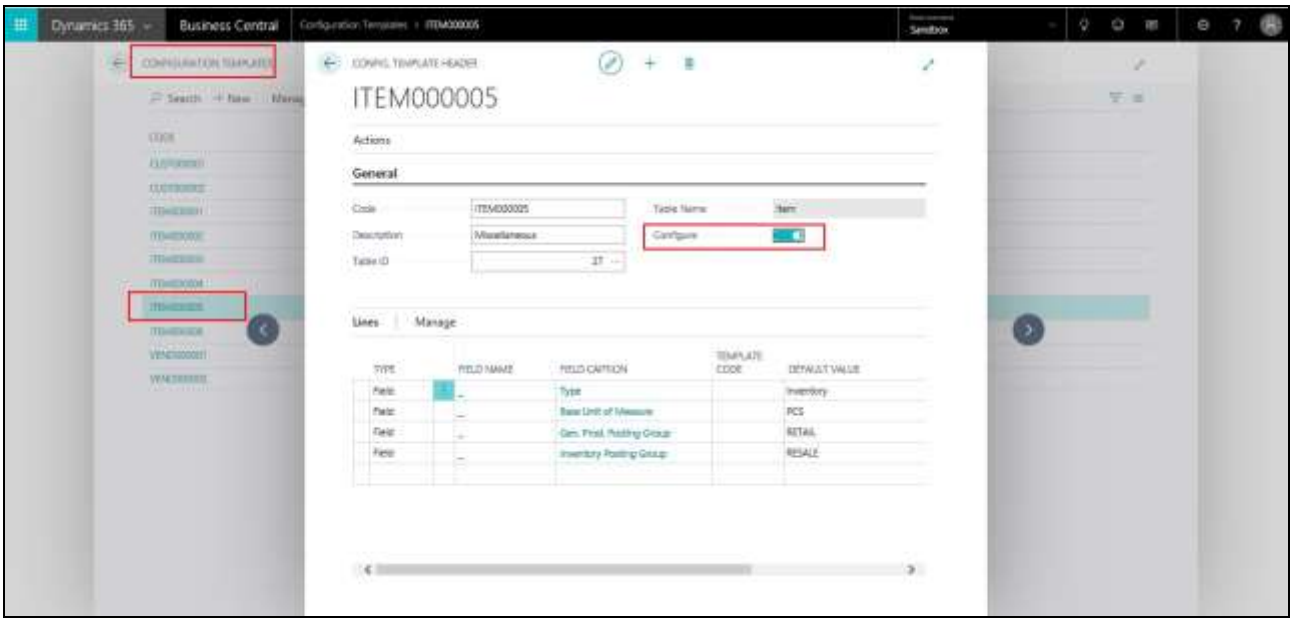
Similarly create below Items in Business Central.

No.	Description	Base Unit of Measure	Inventory Posting Group	Unit Price	Unit Cost	Gen. Prod. Posting Group	Item Category Code
156-FHD	15.6 inch Full HD Display	PCS	RESALE	80	56	RETAIL	SUPPLIERS

156-HD	15.6 inch HD Display	PCS	RESALE	100	70	RETAIL	SUPPLIERS
16-FHD	16 inch Full HD Display	PCS	RESALE	130	91	RETAIL	SUPPLIERS
16-HD	16 inch HD Display	PCS	RESALE	115	80.5	RETAIL	SUPPLIERS
DDR3	DDR 3 - 4 GB	PCS	RESALE	25	17.5	RETAIL	SUPPLIERS
DDR4-2133	DDR4 2133 MHz - 8 GB	PCS	RESALE	45	31.5	RETAIL	SUPPLIERS
DDR4-2400	DDR4 2400 MHz - 8 GB (H Quad Core Processor)	PCS	RESALE	60	42	RETAIL	SUPPLIERS
DOLBY-SPEAKER	High Quality Dolby Speakers 10W	PCS	RESALE	50	35	RETAIL	SUPPLIERS
G-620	Intel ® HD Graphics 620	PCS	RESALE	30	21	RETAIL	SUPPLIERS
G-630	Intel ® HD Graphics 630 (H Quad Core Processor)	PCS	RESALE	50	35	RETAIL	SUPPLIERS
HDD 1 TB	HDD 1 TB	PCS	RESALE	180	126	RETAIL	SUPPLIERS
HD-SPEAKER	High Definition Speakers 5W	PCS	RESALE	100	70	RETAIL	SUPPLIERS
I3	Intel - i3	PCS	RESALE	250	175	RETAIL	SUPPLIERS
I5	Intel - i5	PCS	RESALE	290	203	RETAIL	SUPPLIERS
I7-H	Intel - i7, H Quad Core	PCS	RESALE	370	259	RETAIL	SUPPLIERS
I7-U	Intel - i7, U Dual Core	PCS	RESALE	450	315	RETAIL	SUPPLIERS
NK-64-16	NeoKylin 6.0 64 bit	PCS	RESALE	20	14	RETAIL	SUPPLIERS
NVIDIA-930	NVIDIA ® GeForce 930MX 64 Bit	PCS	RESALE	80	56	RETAIL	SUPPLIERS
SSD-1TB	SSD 1 TB	PCS	RESALE	270	189	RETAIL	SUPPLIERS
SSD-512	SSD 512 GB	PCS	RESALE	200	140	RETAIL	SUPPLIERS
UB-16	Ubuntu 16.04 LTS 64-bit	PCS	RESALE	50	35	RETAIL	SUPPLIERS
W10-64-H	Windows 10 Home 64 bit	PCS	RESALE	80	56	RETAIL	SUPPLIERS
W10-64-P	Windows 10 Pro 64 bit	PCS	RESALE	100	70	RETAIL	SUPPLIERS

Configuration Templates:

Search for Configurations Templates and Go to ‘ITEM000005’ (you can create new or select any other as per your choice). Now, set the flag “Configure” to TRUE as shown in below Screen Shot.



Define Parameters

Parameter value: Items we manufacture individually
All these parameter values are assembly items for our main product - Laptop.

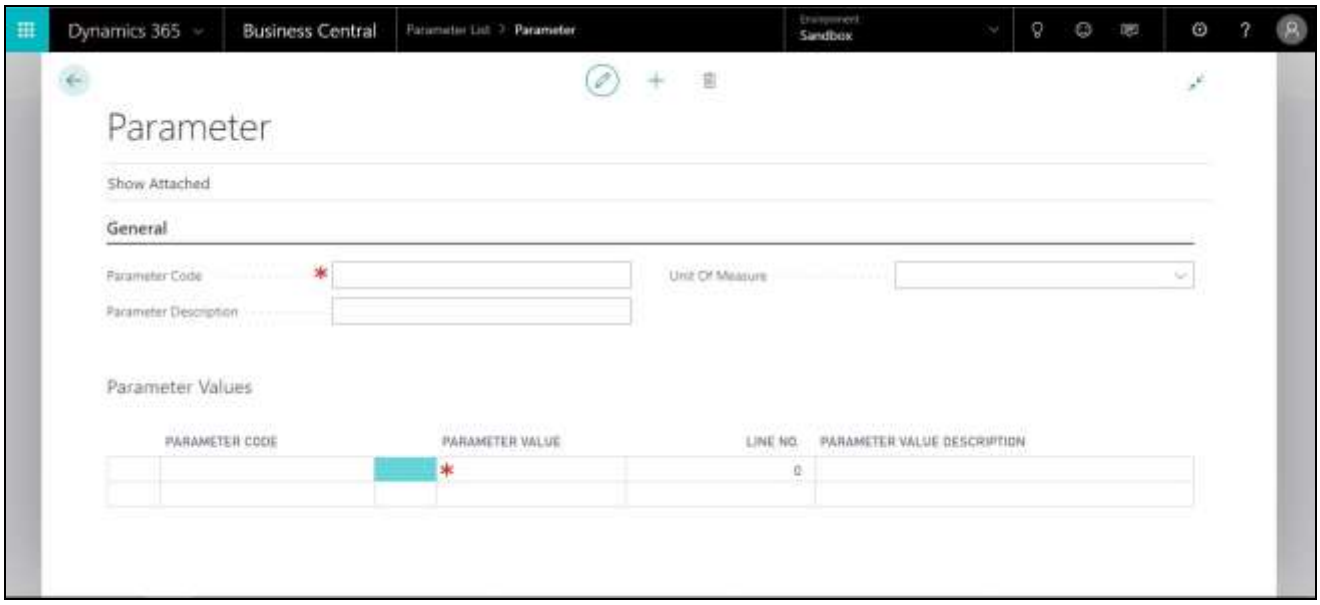
In Business Central, first we must define the parameters and their values. Then we must make product and its assembly code and for each assembly code, we must define its parameter.

Limitation: If a customer chooses Processor I3, we can give him a monitor with 12.5 inches screen only and not with 14 inches or 15.6 inches Screen. So, monitor selection is dependent on Processor. We can do this thing from setting dependency value of parameter. In this way, we must design our product configurator. Then we can use it from sales quote or sales order.

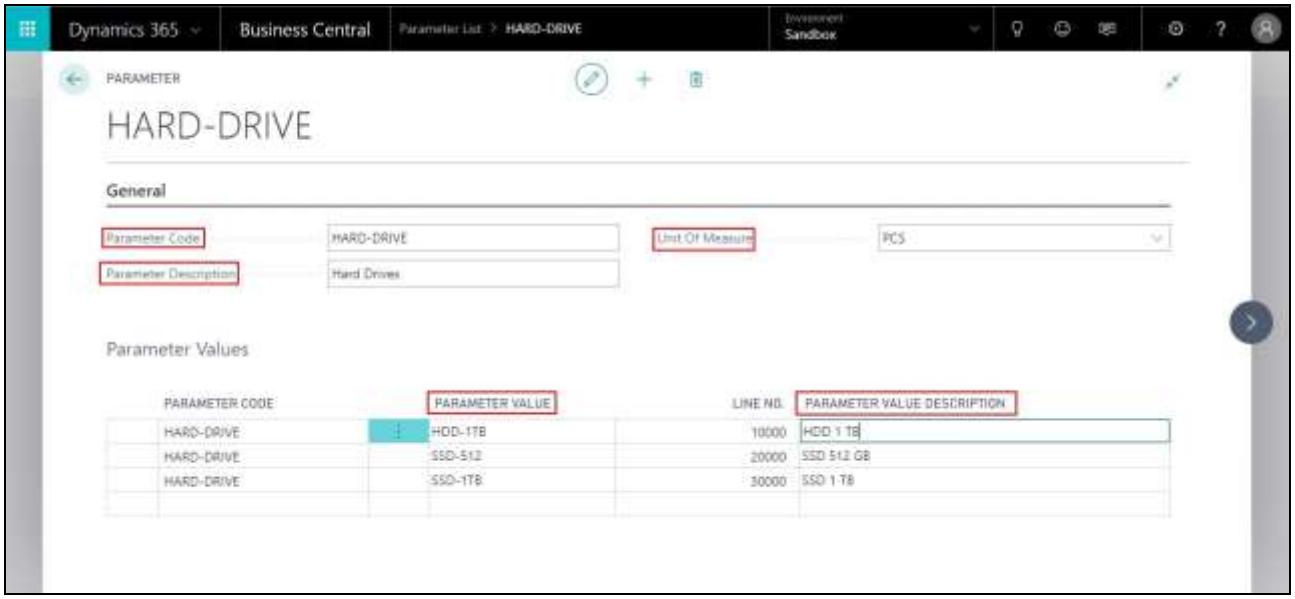
To define parameter, follow below steps.

Step 1: Open 'Parameter List' by the following path: Home/Product Configurator/Design/Parameter List. Click on New.

Step 2: In the Parameter Card page, enter the Parameter and Parameter Values as mentioned in table below.



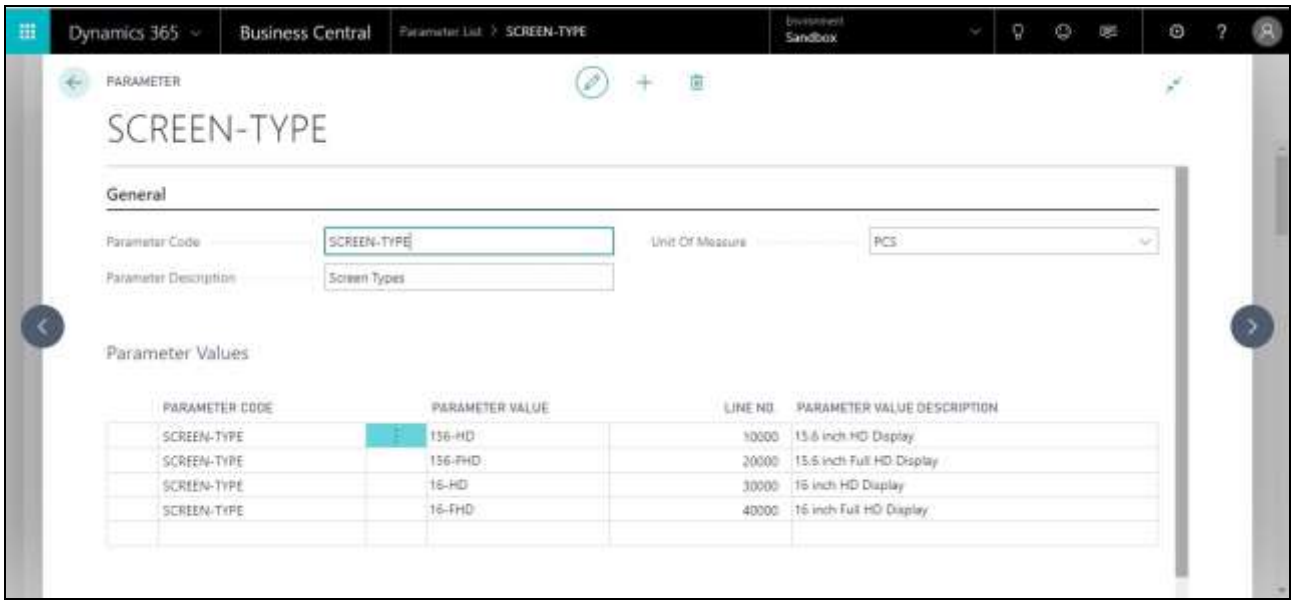
- In 'Parameter Code' field, enter HARD DRIVE
- In 'Parameter Description' field, enter Hard Drives
- In 'Unit of Measure' field, enter PCS
- In 'Parameter Value' field, enter HDD-1TB
- In 'Parameter Description' field, enter 'HDD 1 TB'
- Enter all the parameters and description one by one as per below screen shot



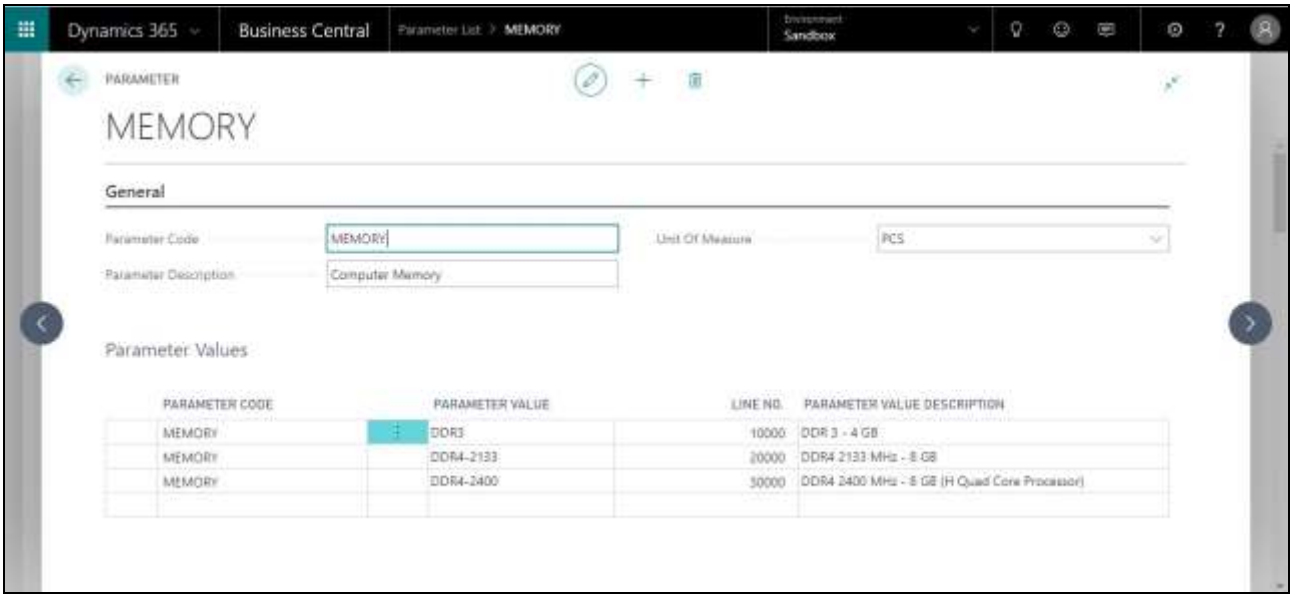
Step 3: Click on OK. *Here we created a parameter and value for HARD DRIVE.*

Similarly, create code for another parameter as follows:

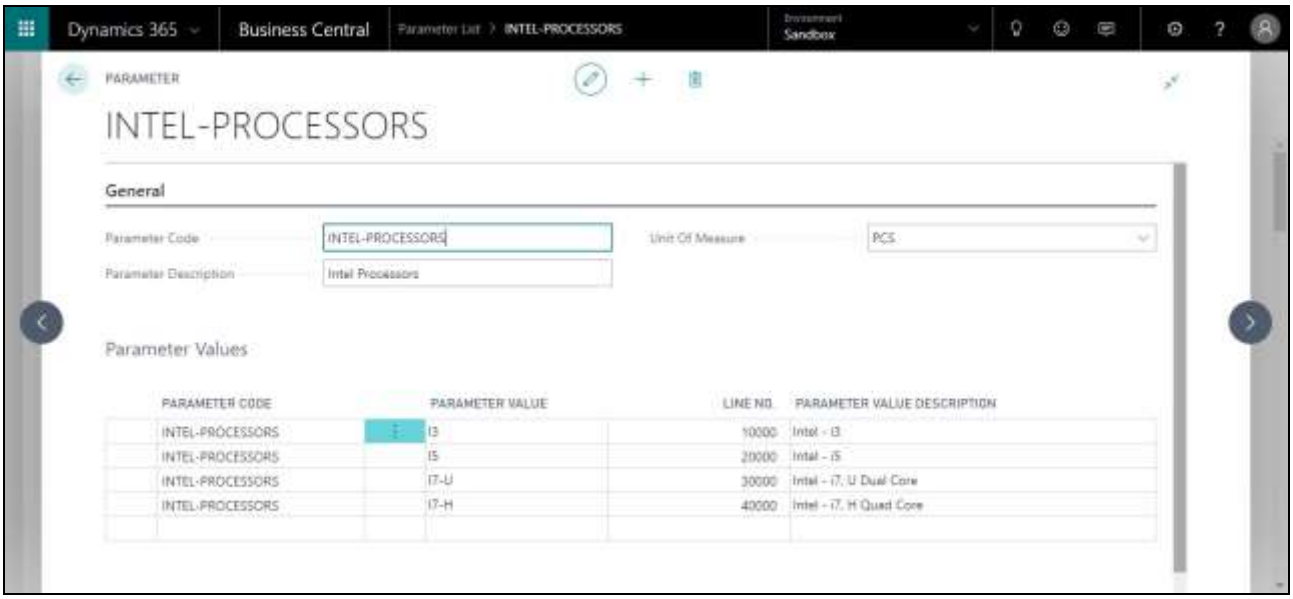
Create Parameter and Value for Screen



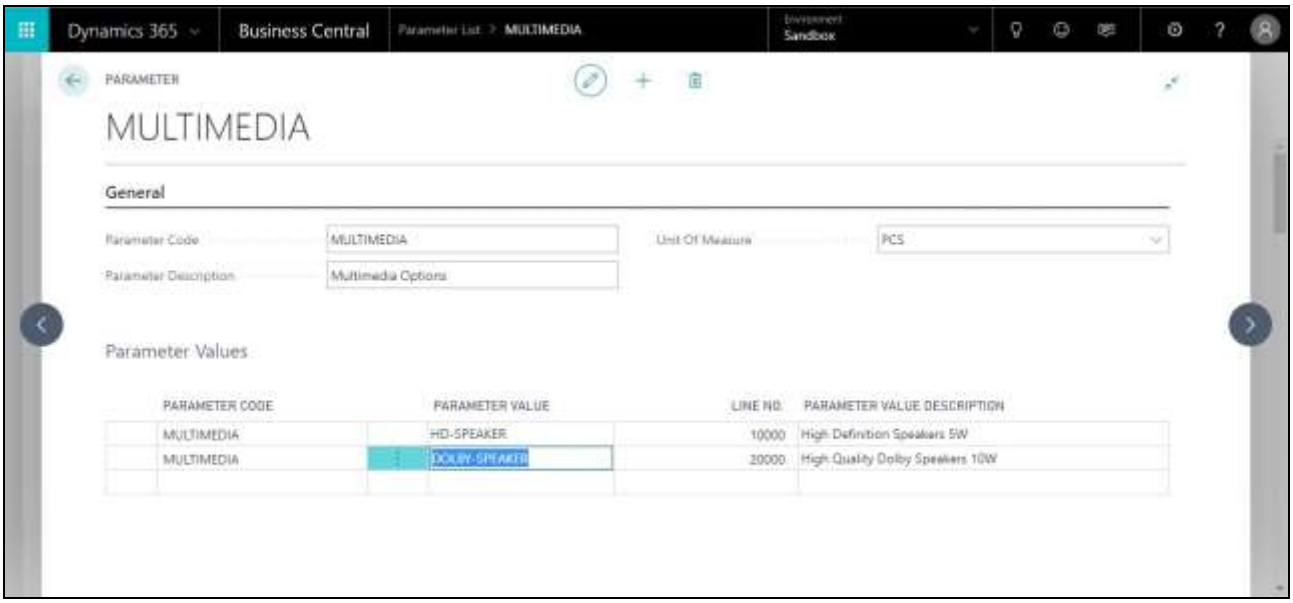
Create Parameter and Value for Memory



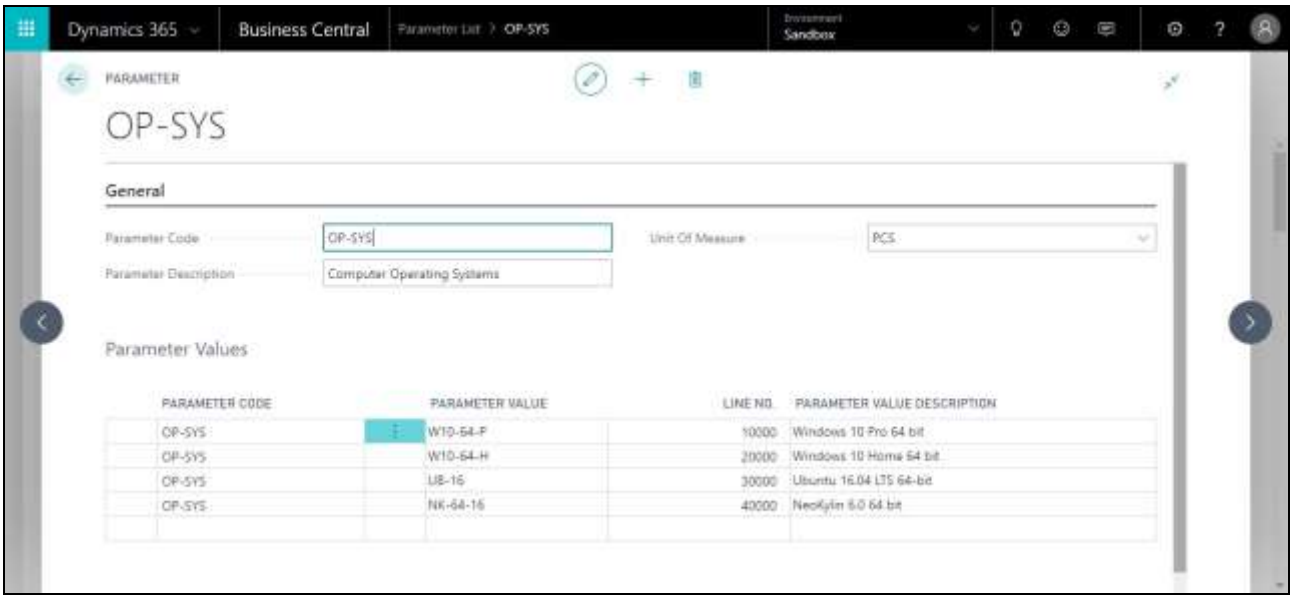
Create Parameter and Value for Processors



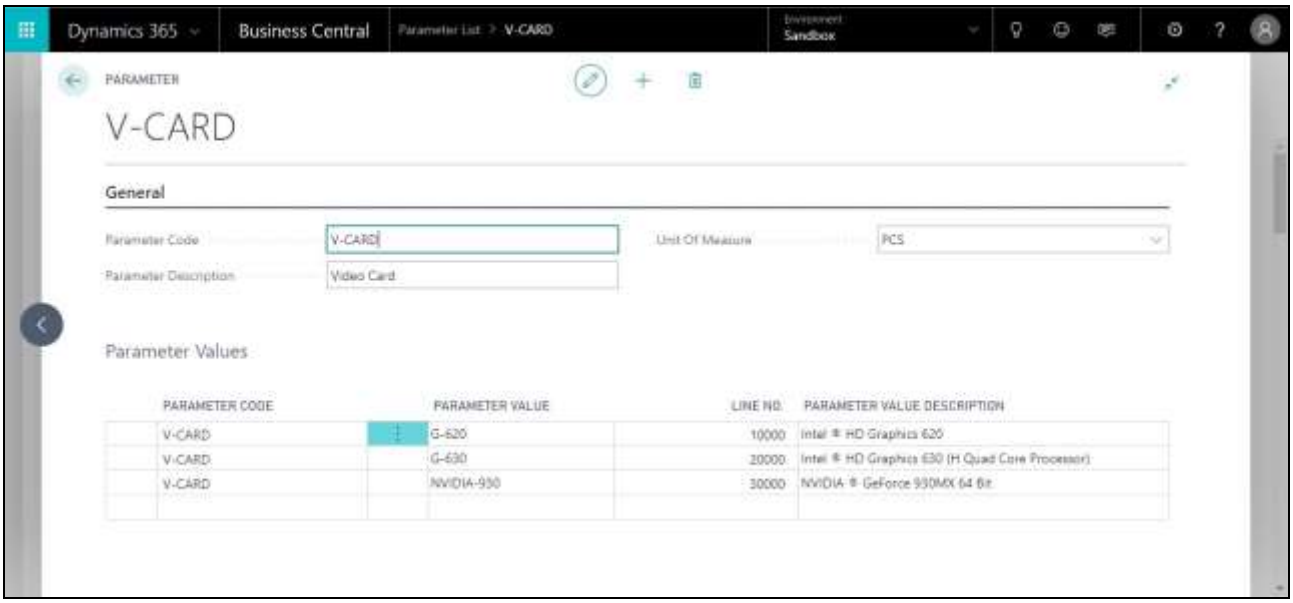
Create Parameter and Value for Multimedia



Create Parameter and Value for Operating System



Create Parameter and Value for Graphics Card

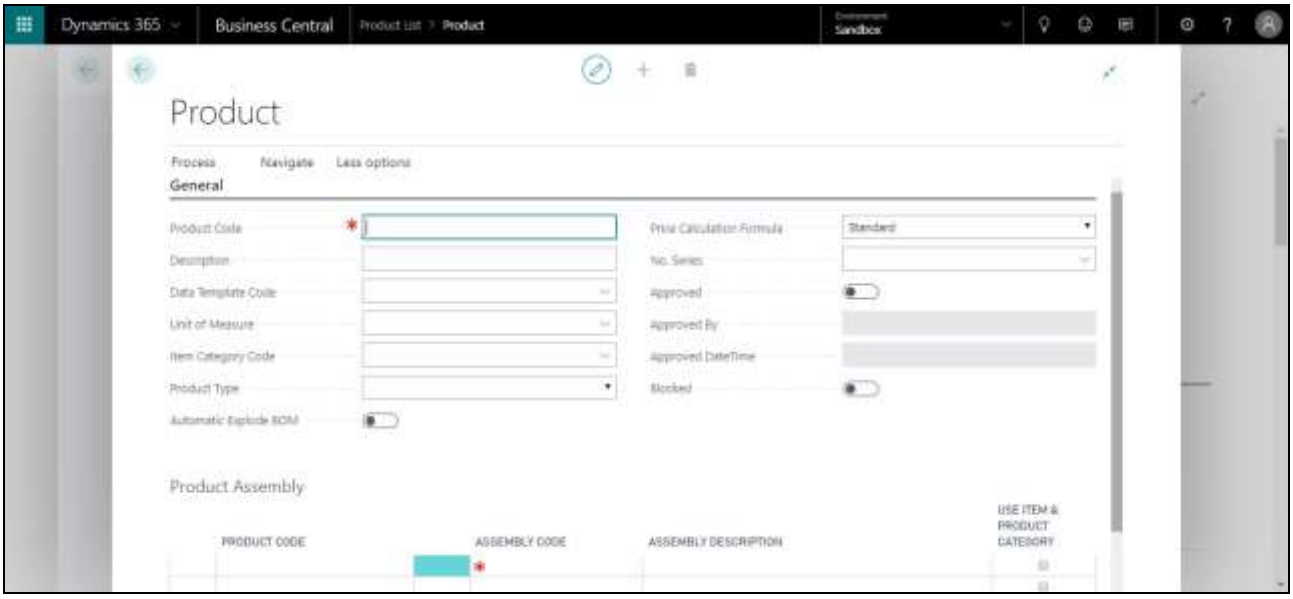


All parameters are set. Now we must define a product & its assembly code.

Create Product

Step 1: Open Product list page by the following path: Home/Product Configurator/Design/Product List

Step 2: Click on ‘New’

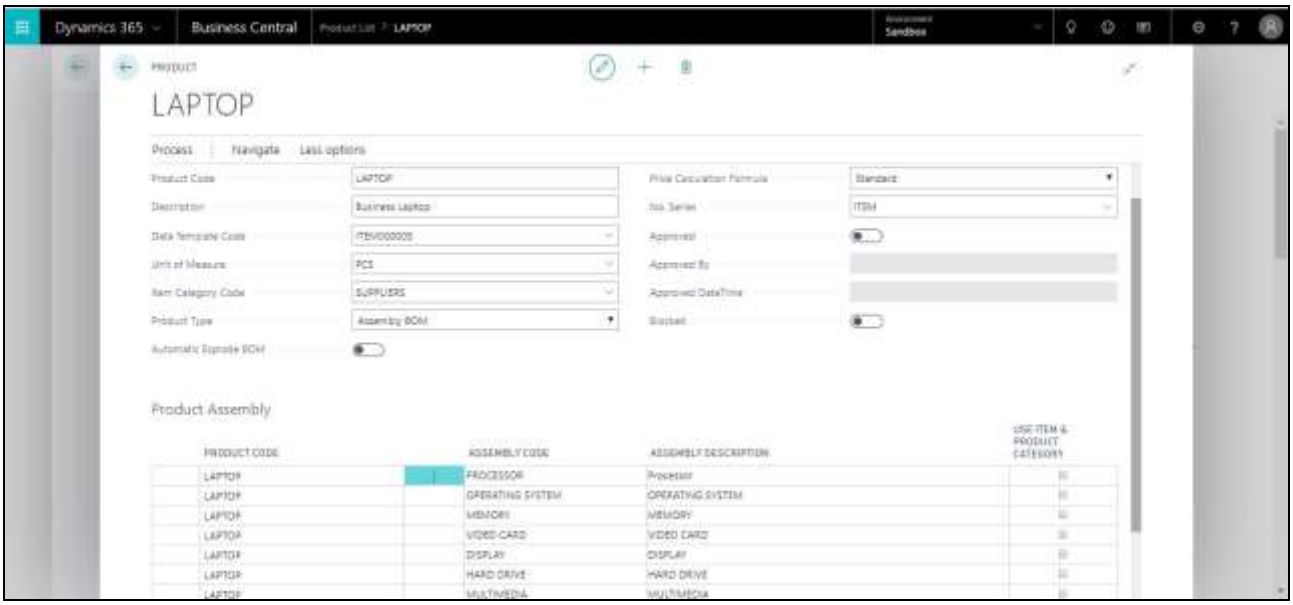


The purpose of each field is described in the table given below:

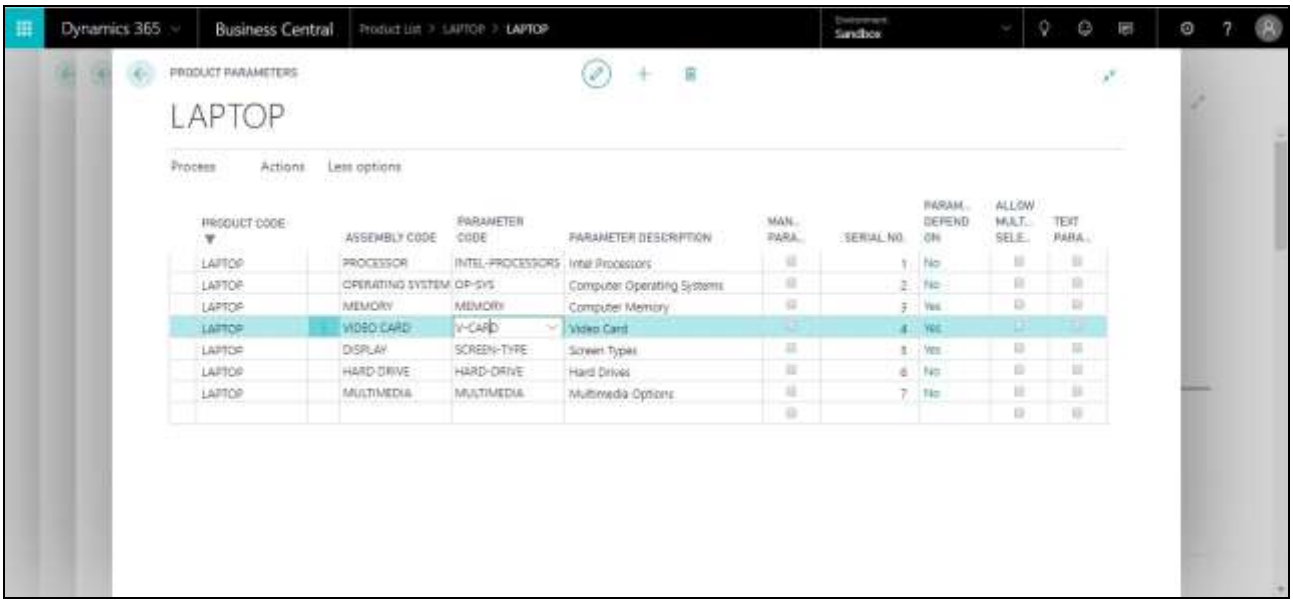
Field	Description
General Tab	
Product Code	Code of for the Product
Description	Description of Product
Data Template Code	Item template code which will be applied on item that will be generated by Product Configurator. NOTE: The template code must have flag “Configure” TRUE.
Unit of Measure	UOM for Product
Item Category Code	Item category code of Product
Product Type	Specify if the Product Type is Assembly BOM or Production BOM
Automatic Explode BOM	Set to TRUE if automatically Explode BOM
Price Calculation Formula	There are two options to select from: Standard: Configurator will consider assembly item's standard price (without discount) Discounted: Configurator will consider assembly item's discounted price, if available.
No Series	Number series for product
Approved	By setting this check box to TRUE, you can take this product configurator in use.
Approved By	Name of the Approver.
Approved DateTime	Date and Time of the Approval
Blocked	If the Blocked flag is set to FALSE, the configurator will no longer be in use.
Product Assembly	

Assembly Code	Define Assembly code for Product (can be called the top level BOM for Product)
Assembly Description	Define Assembly Code's Description.

The Product card will look like below screen shot



Step 3: Click on 'Product Parameter'. Select the Assembly Code and the Parameter Code to fill up the Product Parameters.



In 'Assembly Code' field, select assembly code whose sequence is first. **Assembly codes are to be entered in ascending order.** Here for Laptop configuration, what Processor the customer wants must be defined first. So here we will enter 'PROCESSOR' first in "Assembly Code".

In ‘Parameter Code’ field select Parameter code which is suitable for a assembly code. e.g. For the assembly code “PROCESSOR”, we have selected the “INTEL PROESSOR” as parameter Code. On selection of parameter code ‘Parameter Description’ will get updated automatically.
Set the Mandatory Parameter to TRUE if the selection of value for “Assembly Code” is mandatory when configuring the Product.

Note that the Serial no. will update automatically. If the parameter is dependent on another parameter, the “Parameter Depend On” will show Yes.

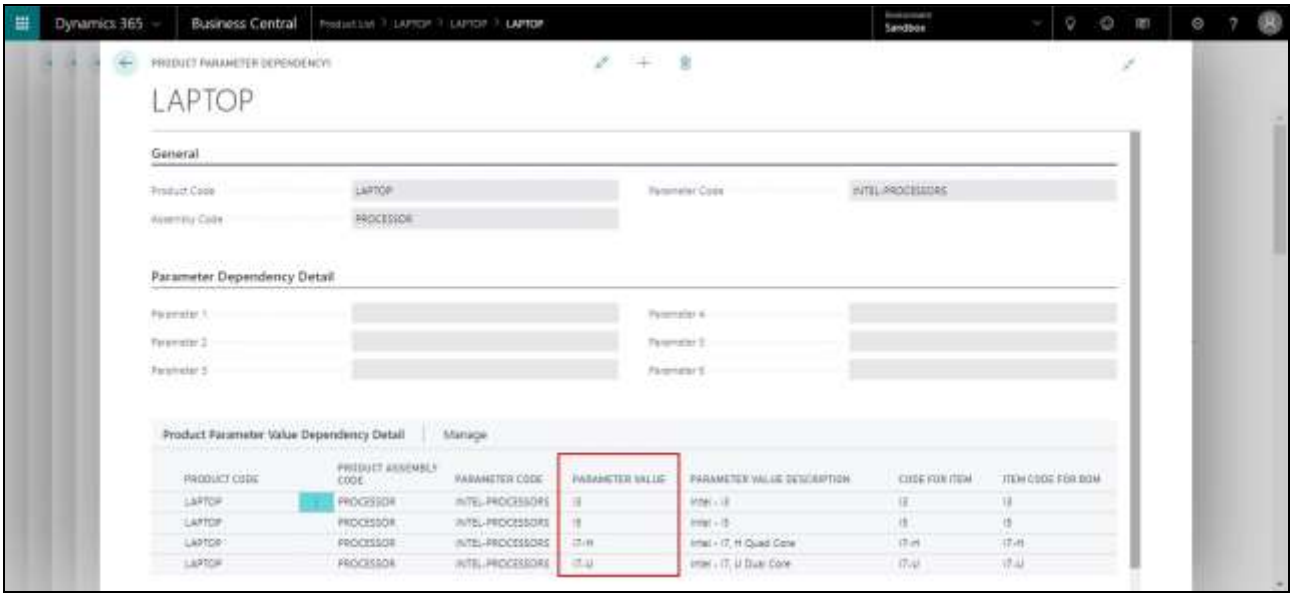
Establish Dependency of Parameters

In the above case, Processor selection comes first in the hierarchy, so customer can select any processor as he wants. Screen size selection comes second in the hierarchy and there is a limitation that if a customer selects I3 Processor, he should be given a monitor with 15.6 Inches screen only. If he selects I5 processor then he can select a monitor with screen size 16 inches and so on. We need to set this up as follows:

Step 1: Select first line of Processor.

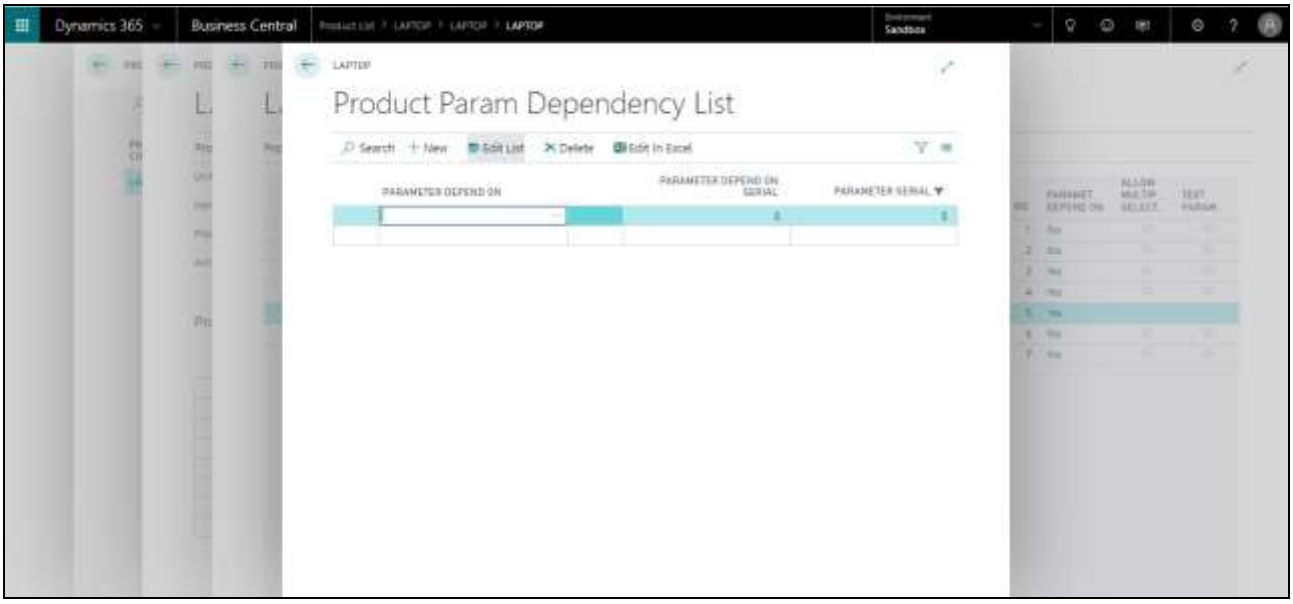
Step 2: Since PROCESSOR is independent of any parameter, there is no need to set Dependency, but we must set dependency value with no one. So, click on Process \ ‘Dependency Value’.

Step 3: Select ‘Parameter Value’, I3, I5, &I7 one by one as shown below:



Step 4: Code for Item’ field will update as per parameter value, and it will become a character/digit of item code.

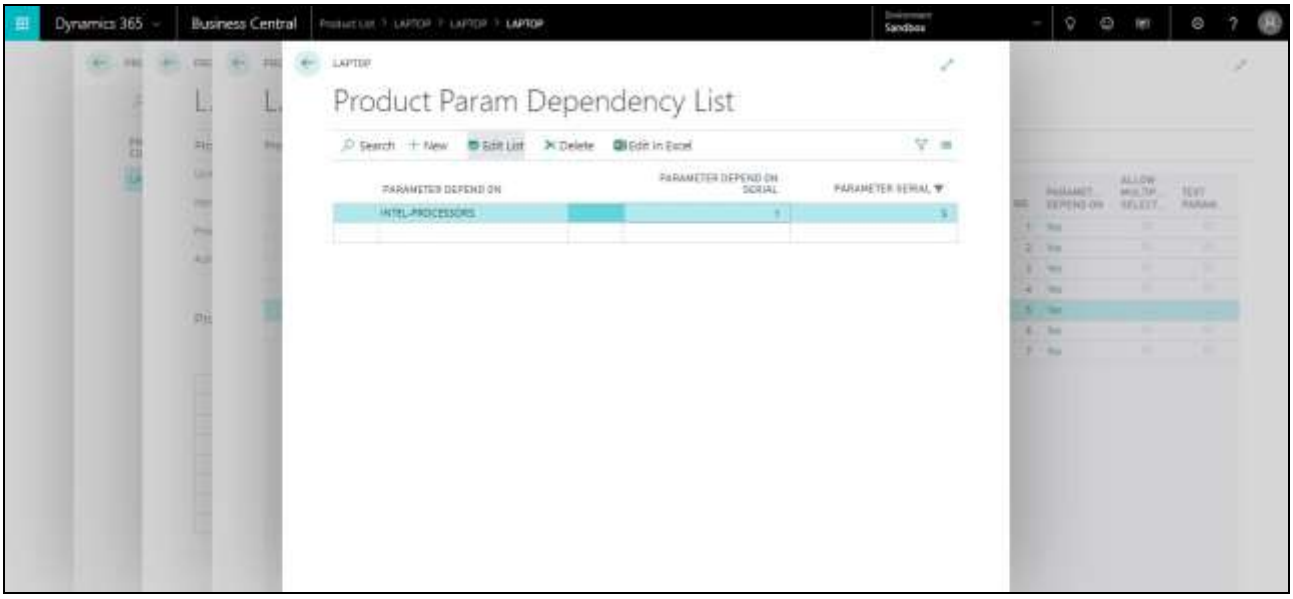
Step 5: Select the line which contains Assembly Code SCREEN TYPE. Go to Process \ Dependency from the ribbon.
Note that the field “Parameter Serial Field” will be automatically filled with the value from the Parameter Serial No field.



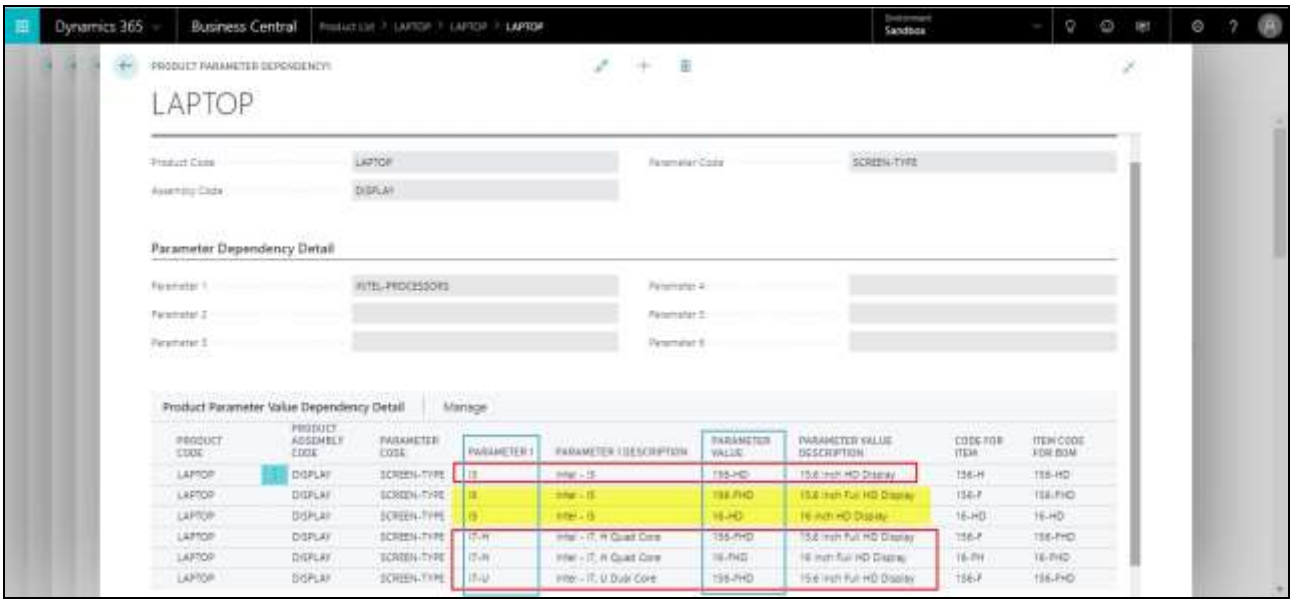
Step 6: As the computer memory is dependent on the Processor, select the “INTEL-PROCESSOR” in the parameter Depend On field.

As you define ‘Parameter Depend On’ field, ‘Parameter Depend on Serial’ will get updated as per the serial number of ‘Processor’.

You can also set Multi Dependency for one parameter.



Step 7: Confirm that the line of ‘SCREEN TYPE’ is still selected and click on Process \ Dependency Value.

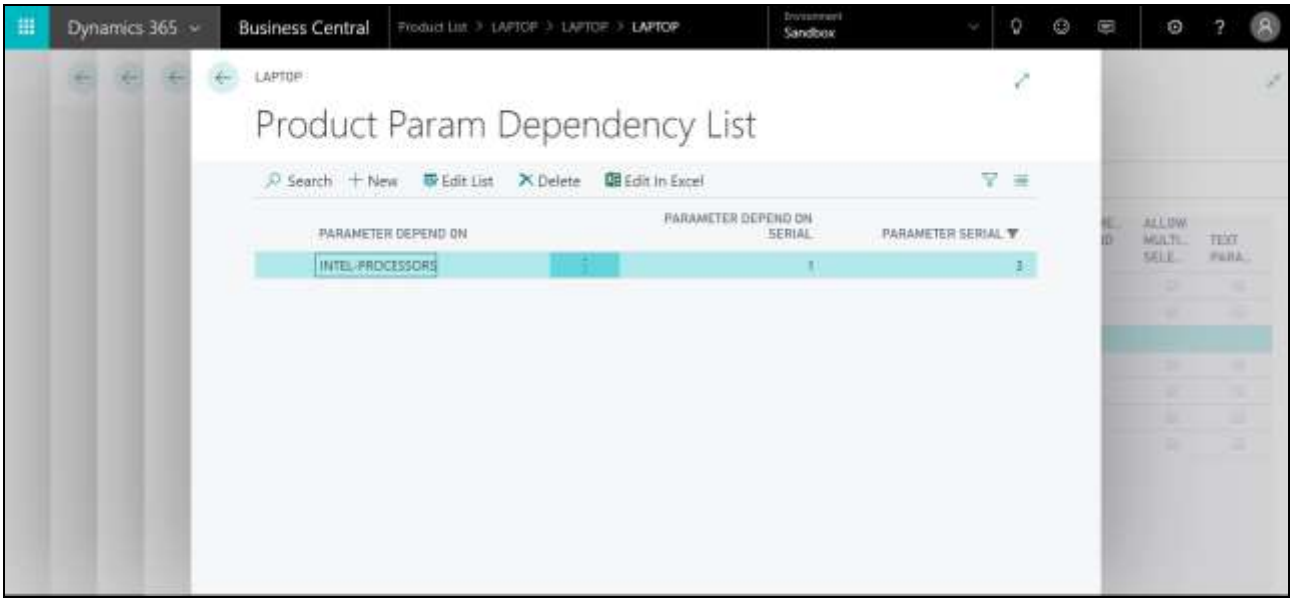


Dependency is set as per this logic:
If Processor I3 is selected, then Customer can select 12.5 inches screen
If selected Processor I5, then Customer can select 12.5inches & 14 inches screen

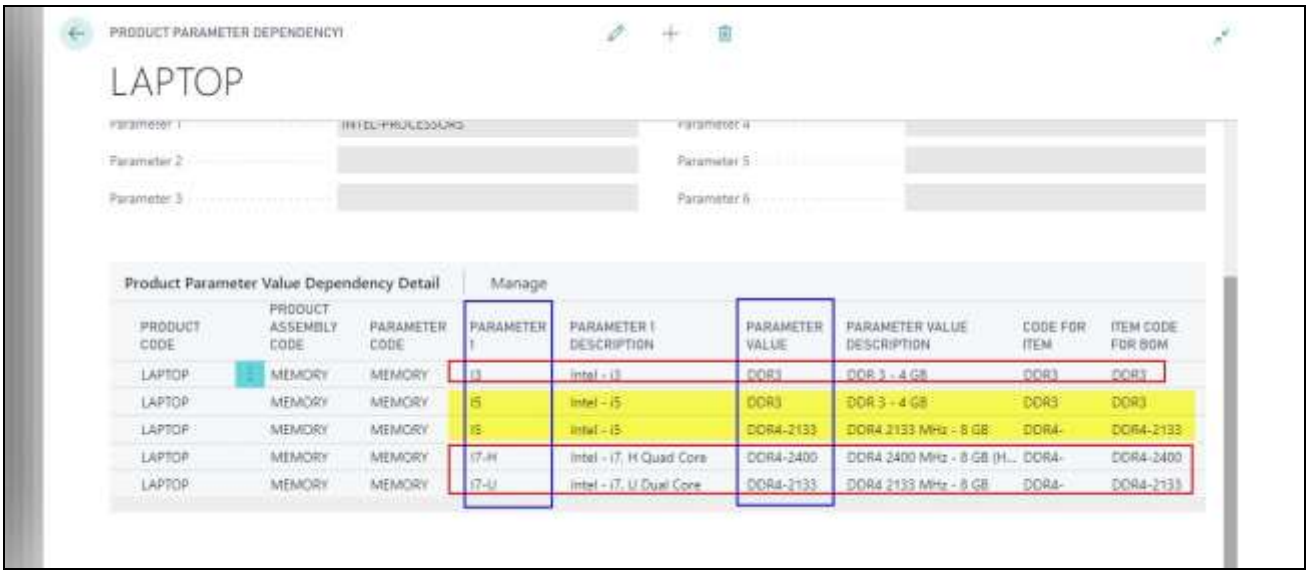
If selected Processor I7, then Customer can select 15.6 inches screen

Step 8: Similarly, set the Dependency and Dependency value for parameter Memory

Go to Actions \ Dependency \ New

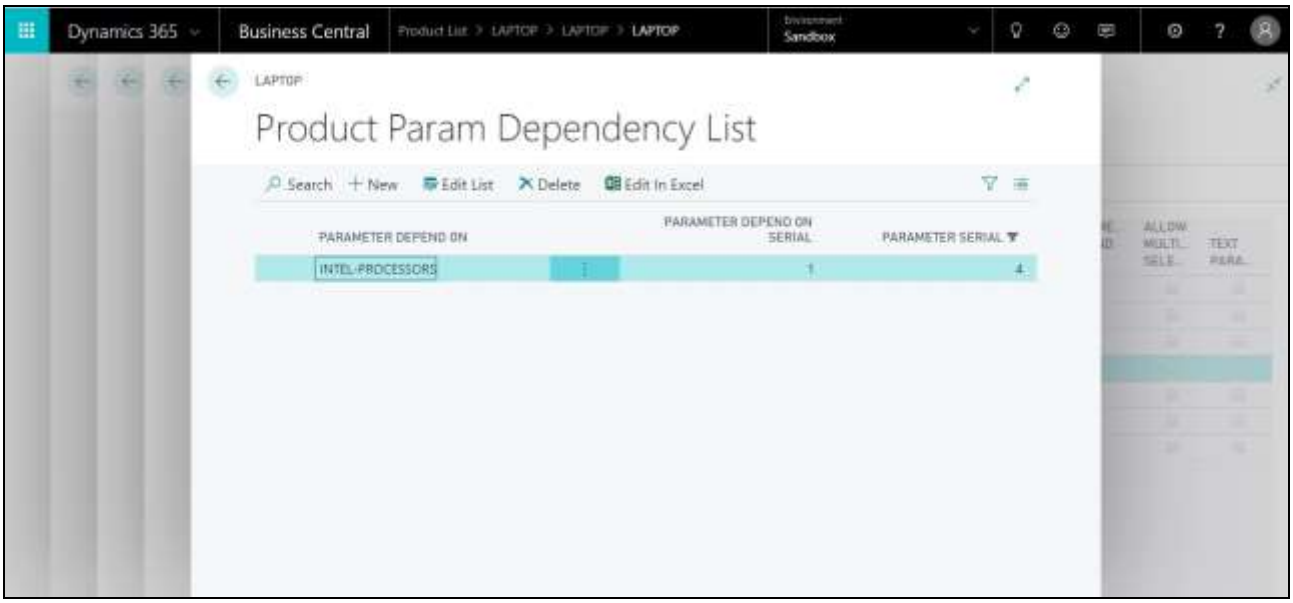


Make sure that the MEMORY Line on the parameter list is still selected and Go to Actions \ Dependency Value. Fill up the dependency values as shown in below screen shot.

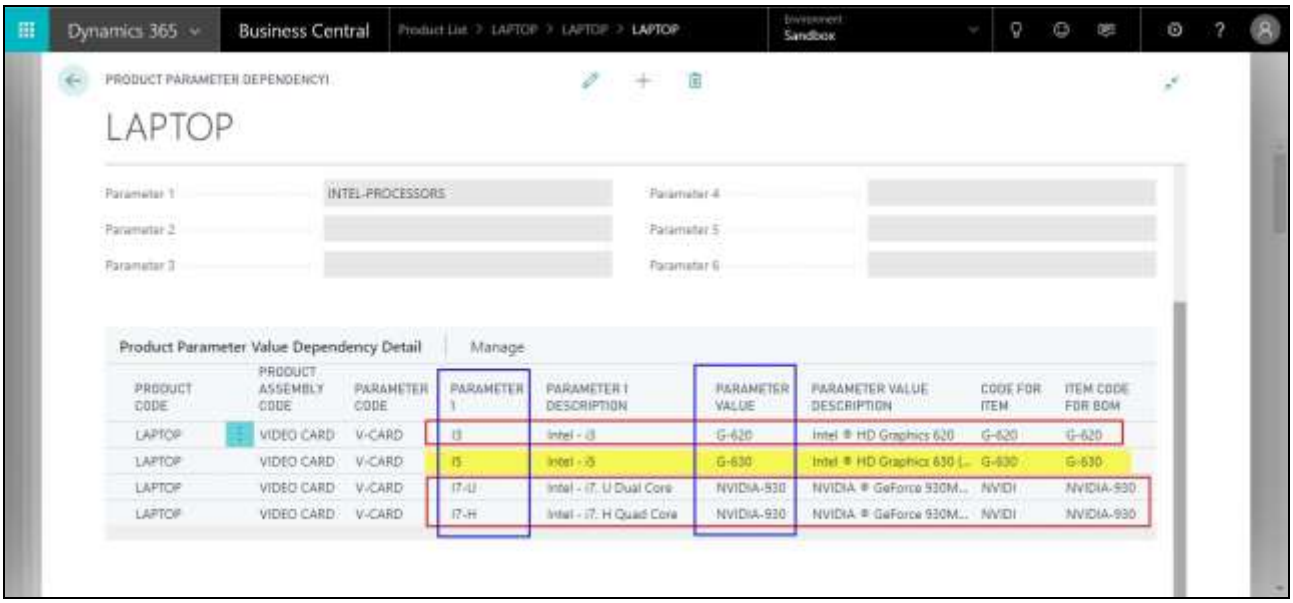


Step 9: Similarly, set the Dependency and Dependency value for parameter VIDEO CARD

Go to Actions \ Dependency \ New



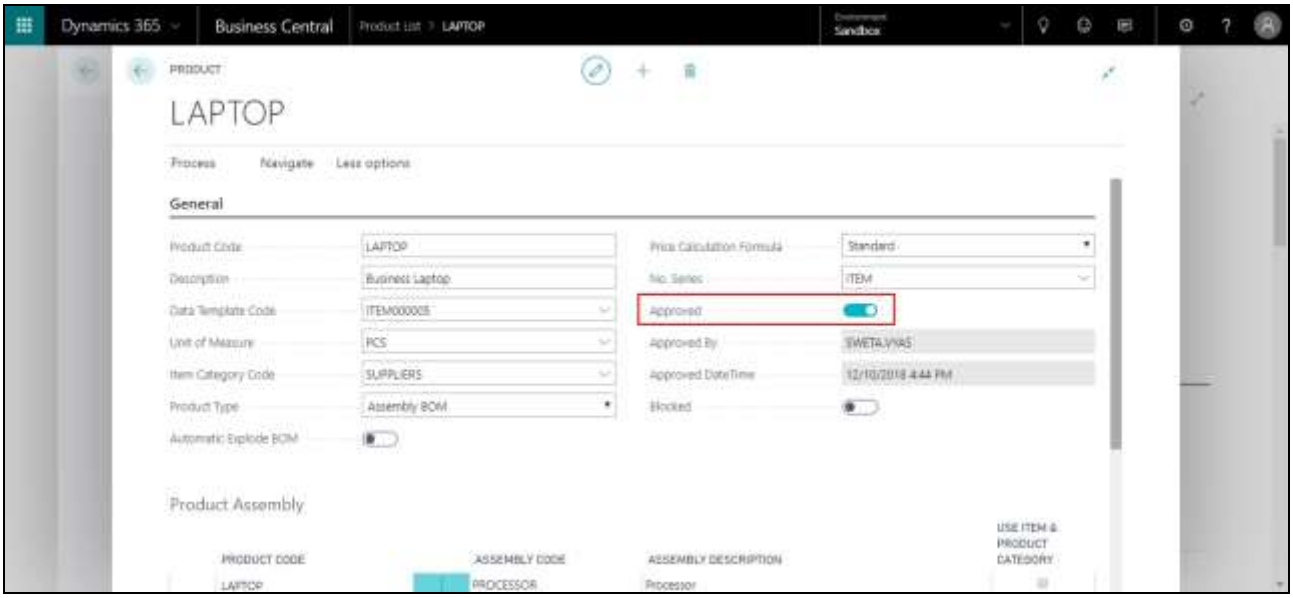
Make sure that the VIDEO CARD Line on the parameter list is still selected and Go to Actions \ Dependency Value. Fill up the dependency values as shown in below screen shot.



Now design for product configurator is ready.

We can use this **product configurator** while making sales quote or sales order. Now we will use it from sales quote.

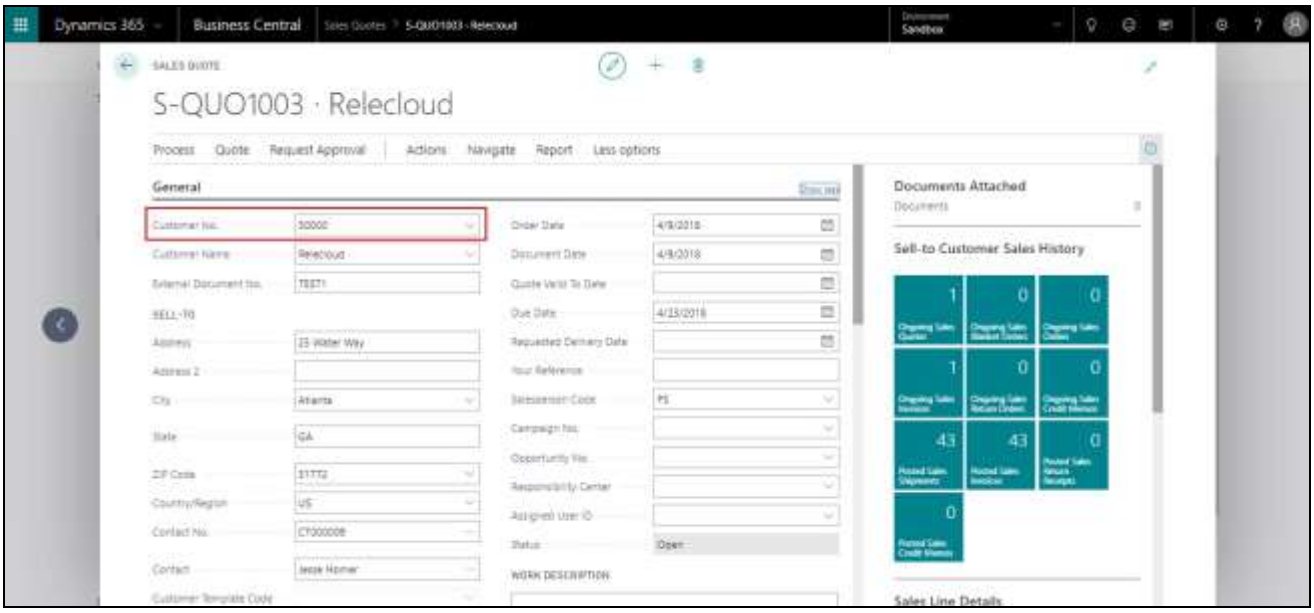
Approve product ‘Laptop’ if approve tick mark is not there.

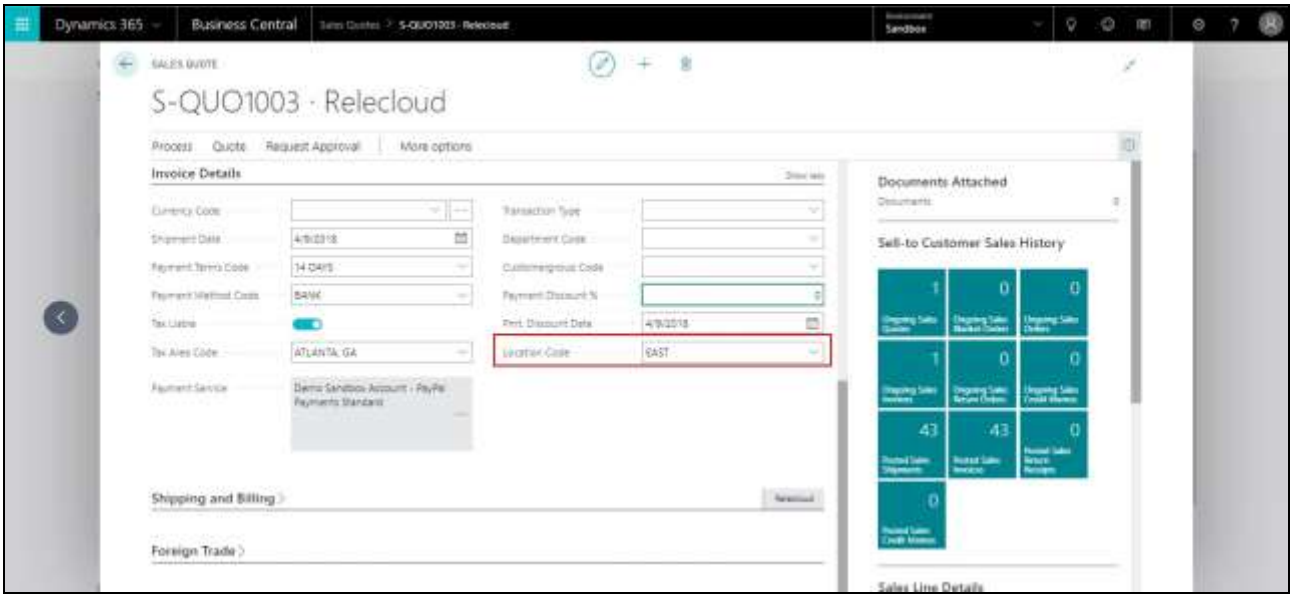


Use Product Configurator

Assume that Customer no. ‘50000’ wants to purchase ‘LAPTOP’ and your sales person is dealing with customer about Laptop and giving him sales quotation at that time.

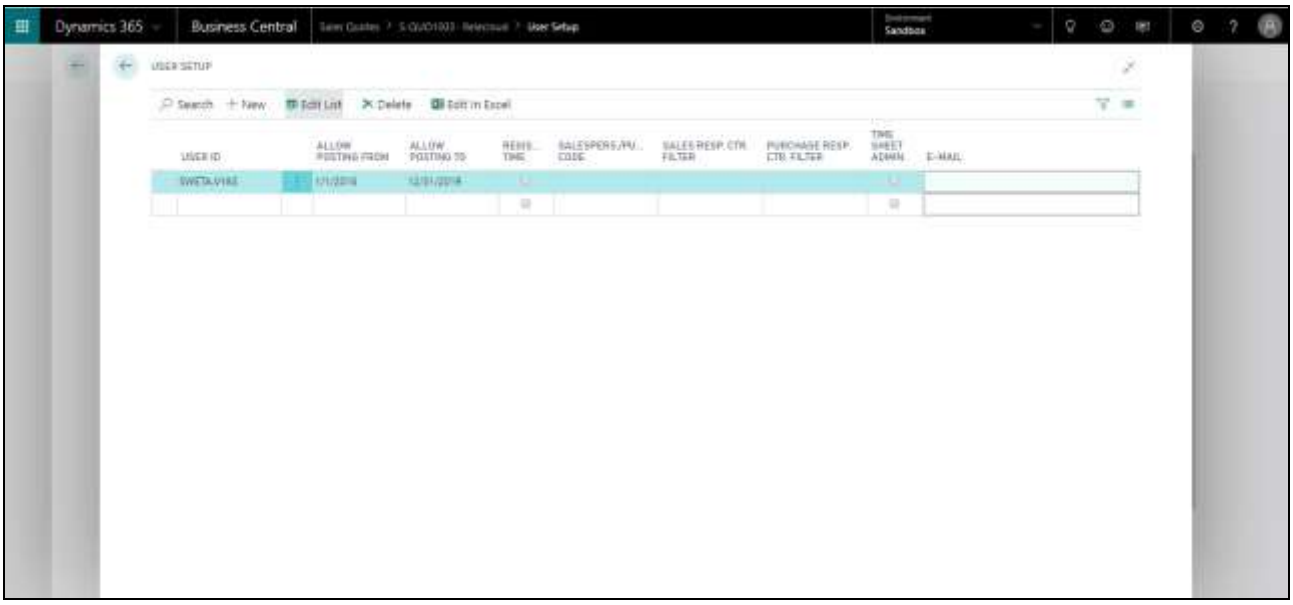
Step 1: Create Sales quote for Customer no. ‘50000’, for location ‘EAST.

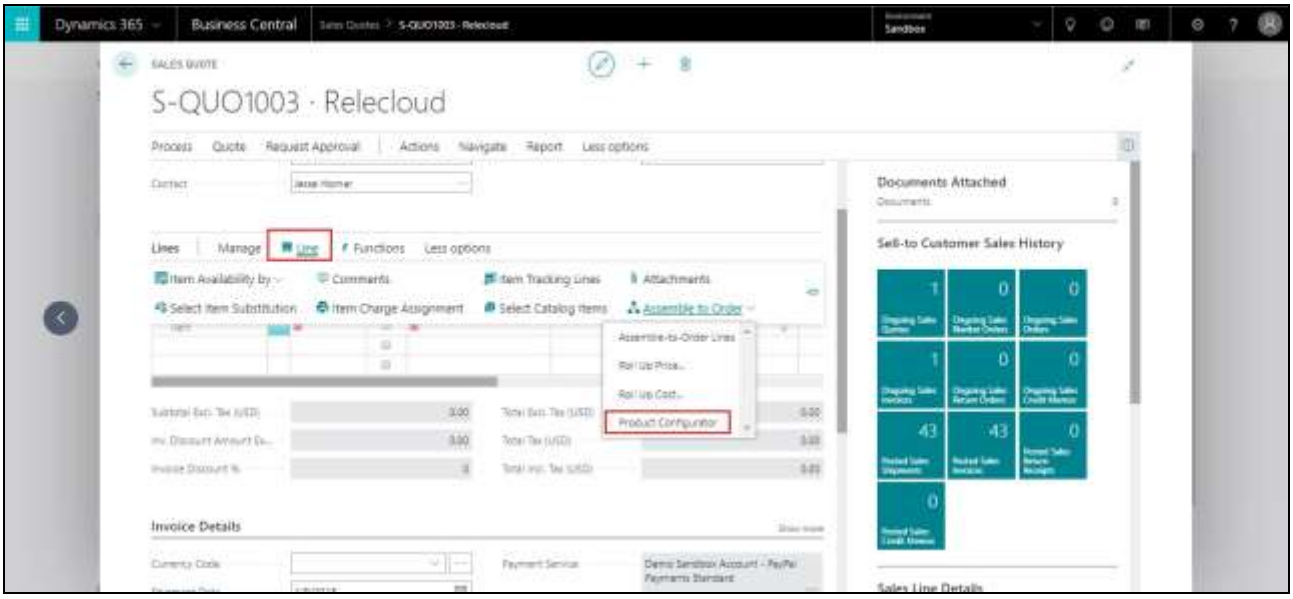




Step 2: In ‘Type’ field, select ‘GL Account’. Press TAB twice and then in the same line again select ‘ITEM’.
NOTE: The above step is to create an empty line of Type ‘Item’ in Sales Quote.

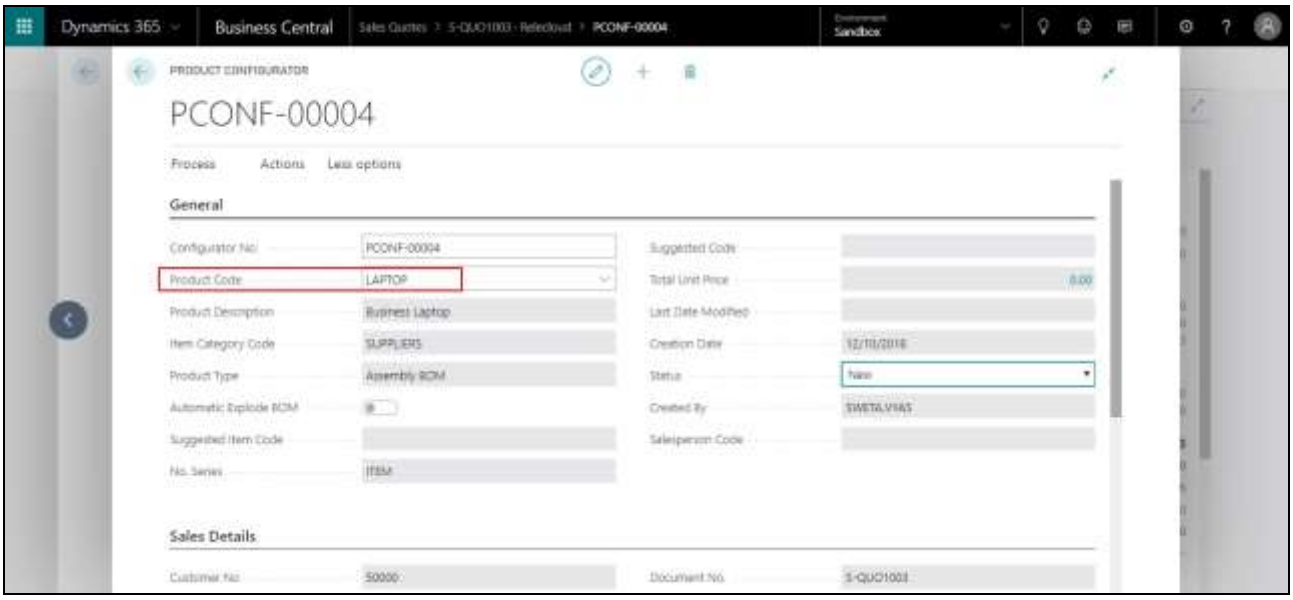
Step 3: Click on “Line” option & Select “Product Configurator”. NOTE: Add the user to the User Setup if it does not exist. Go back to the Sales Quote if it



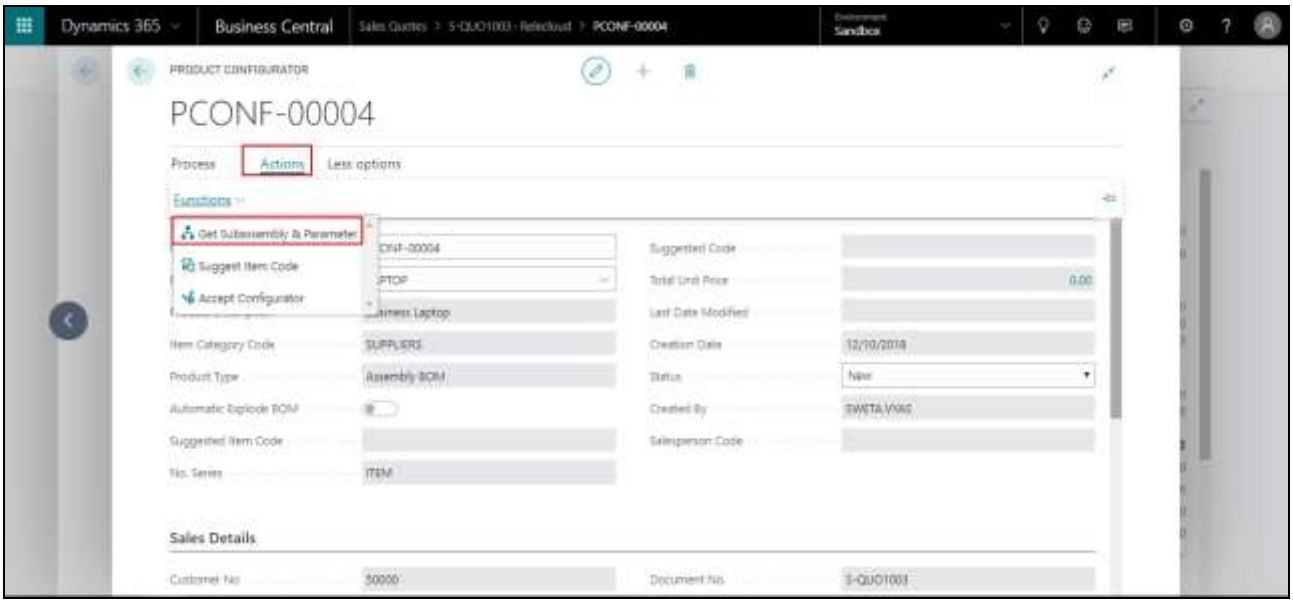


You can see that system has generated Configurator No. ‘PCONF-00004’, as defined in setup

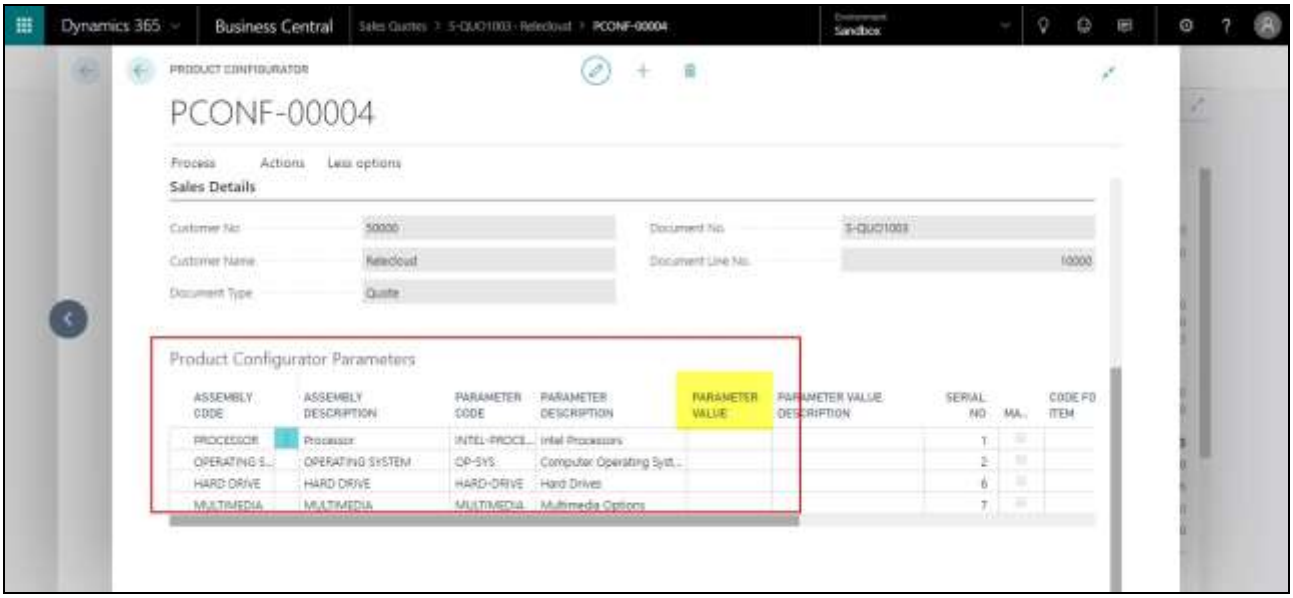
Step 4: Drop down on ‘Product Code’ field and select ‘Laptop’



Step 5: Now click on Actions -> 'Get Subassembly & Parameter'



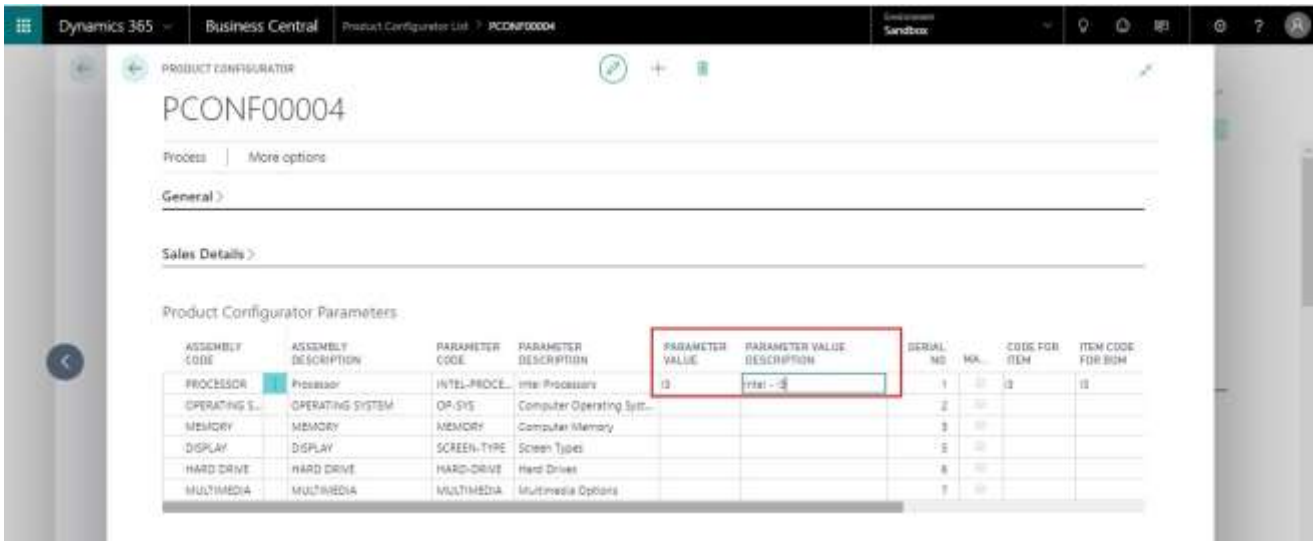
You can see that all the assembly codes defined in 'Product' is available here for parameter value selection.



Step 6: Now Drop down ‘Parameter Value’ field on first line.

Step 7: Select ‘I5’

As soon as you select parameter value I3, its description and code for the item will get updated. System takes parameter value as code for item.



Step 8: Now drop down ‘Parameter Value’ field for Operating System. Select ‘NK-64-16’

Step 9: Drop-down ‘Parameter Value’ field for MEMORY. You will see that only two options are available. That is because of the dependency values selected while creating the product. Select DDR3.

Step 10: Drop-down ‘Parameter Value’ field for Video Card. Select ‘G-620’.

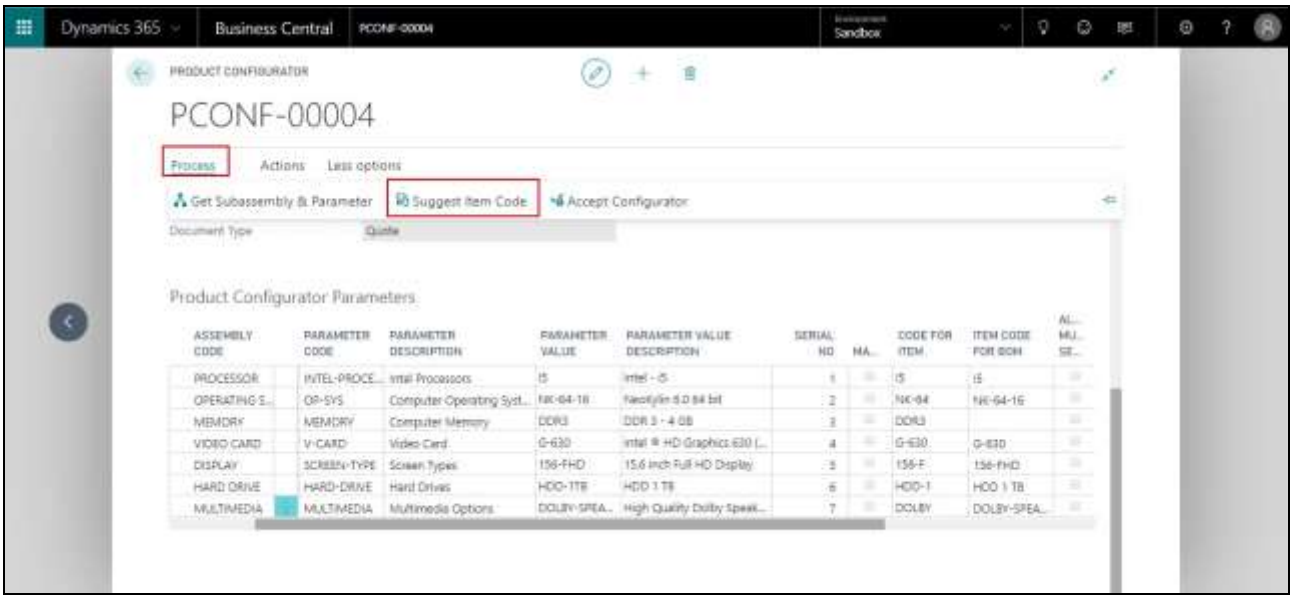
Step 11: Drop-down ‘Parameter Value’ field for Display. Select ‘156-FHD’

Step 12: Drop-down ‘Parameter Value’ field for Hard Drive. Select ‘HDD-1TB’.
Step 13: Drop-down ‘Parameter Value’ field for Multimedia. Select ‘DOLBY-SPEAKER’.

All the parameter values are thus defined.

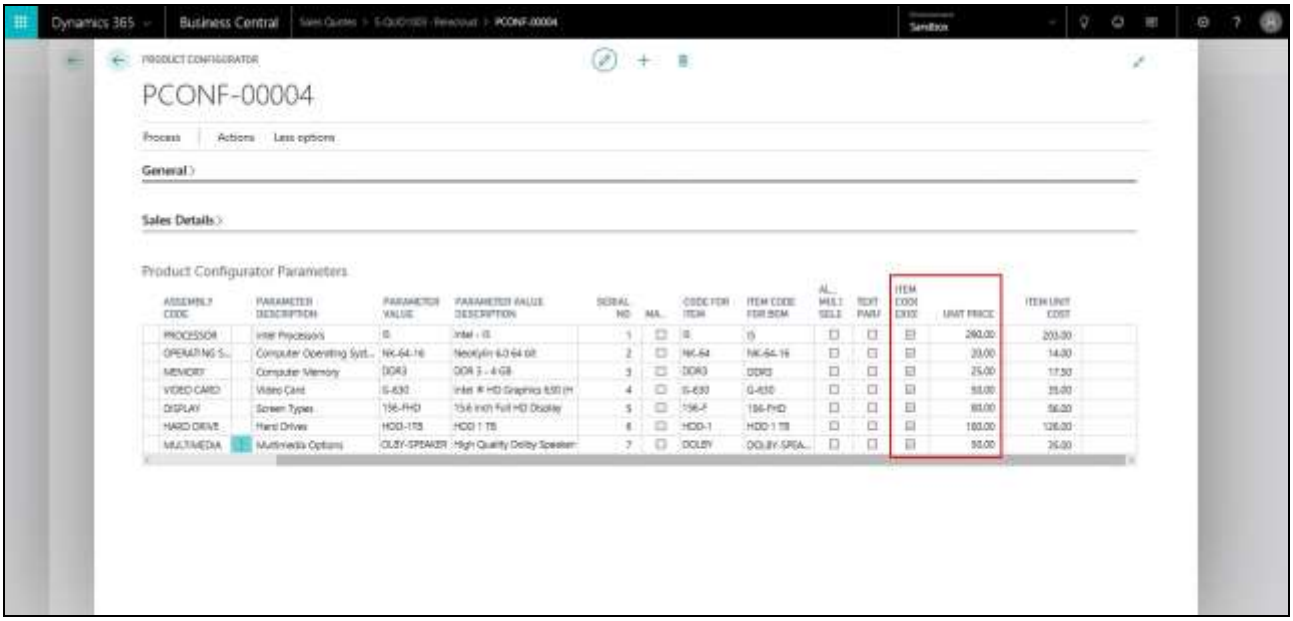
Step 14: Now go to Process and click ‘Suggest Item Code’.

Click ‘YES’ in message box.
Click ‘OK’ in message box.



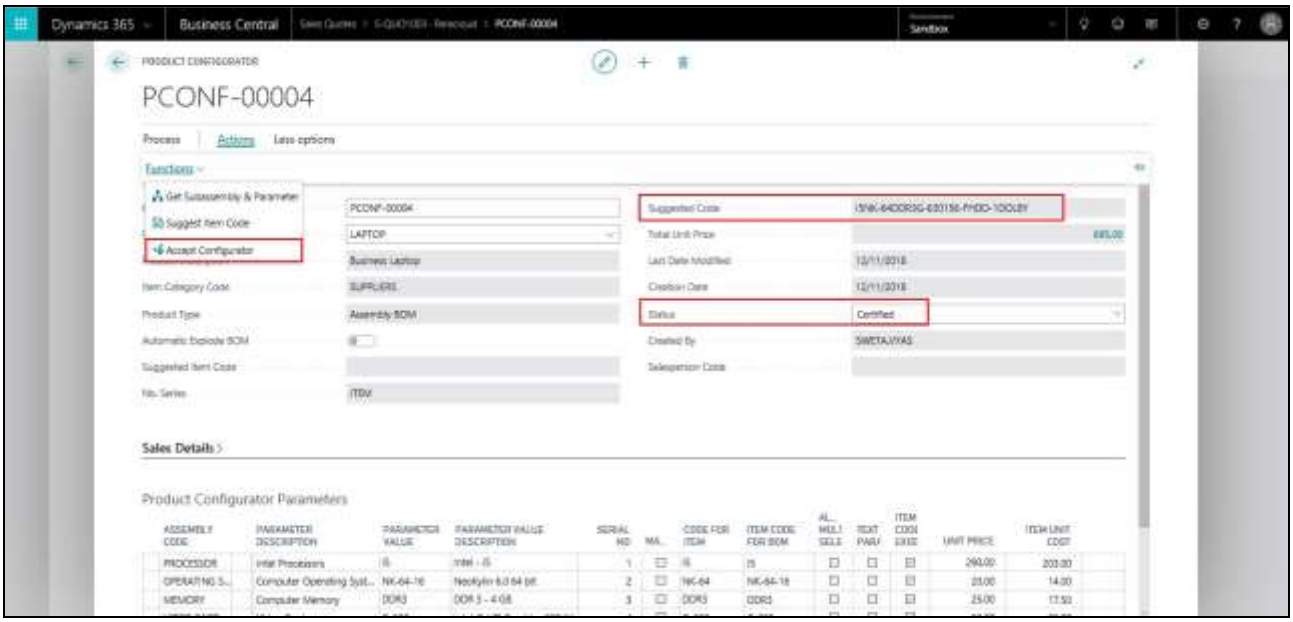
In Product Configurator Subassembly Tab, you can see a tick mark in ‘**Item Code Exists**’ field. It shows that assembly item is exist. If assembly item does not exist, check box will be blank, and we will have to create that item first.

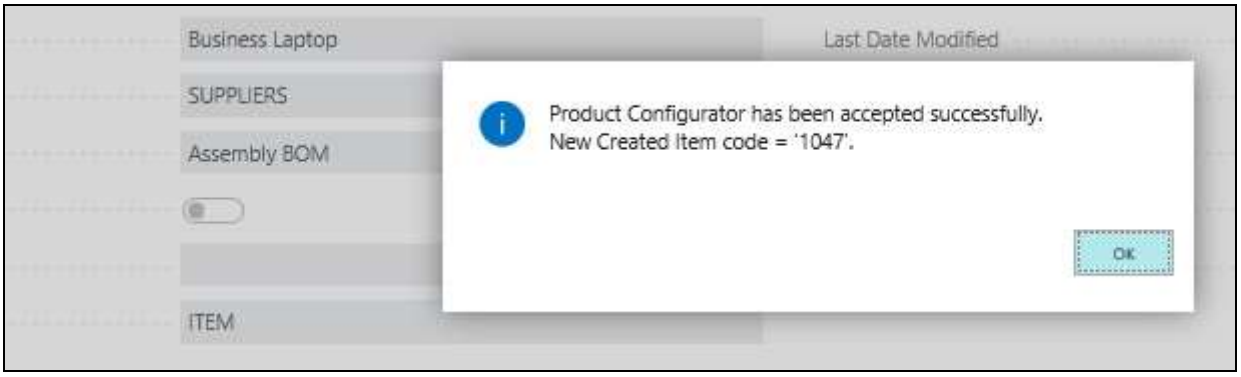
‘Unit Price’ field shows assembly wise price of item. Had we selected ‘Price calculation formula’ as ‘Discounted’ on Product, then it would have captured discounted unit price if item’s discount percentage were defined.



Step 15: Now drop down ‘Status’ field and select ‘Certified’.

Click ‘YES’ in message box

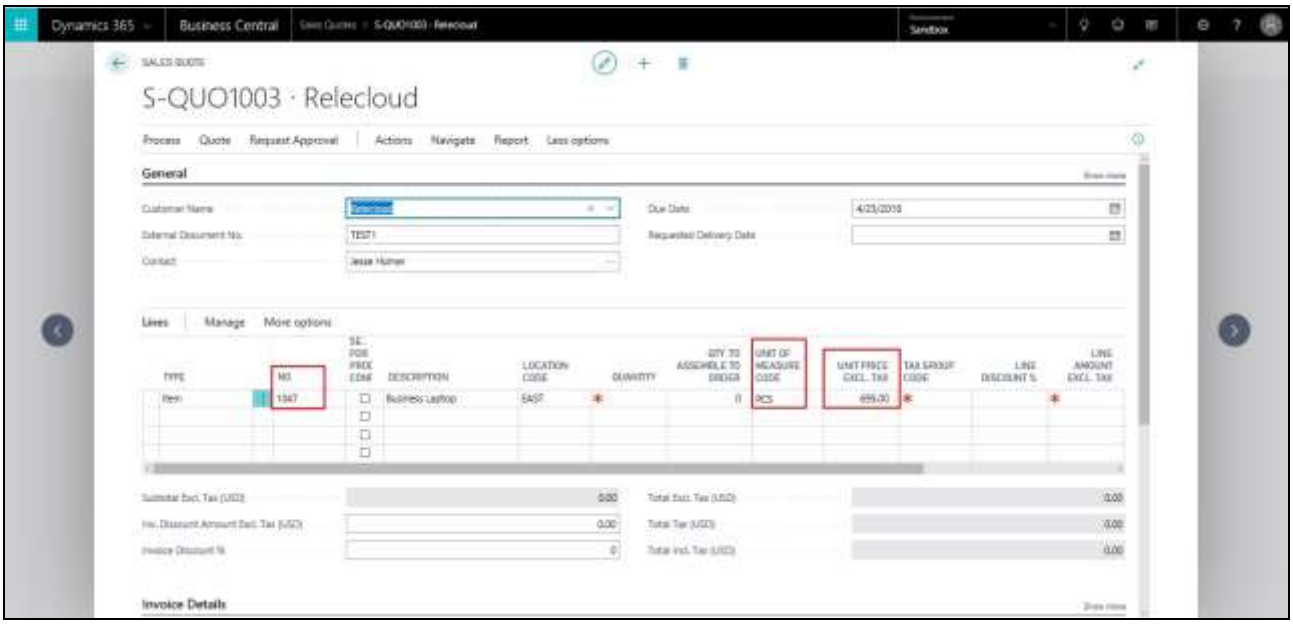




Click ‘OK’ on message box.

Click ‘Back Arrow’ on Product Configurator page to close the page.

You can see that in Sales Quotation, newly created Item code by configurator is updated.
Also ‘Unit Price’ and ‘Unit of Measure’ fields are updated. Newly created item will get updated in the Item list.



In this way, we can configure a product. We can do same thing from Sales Order (method remains same).