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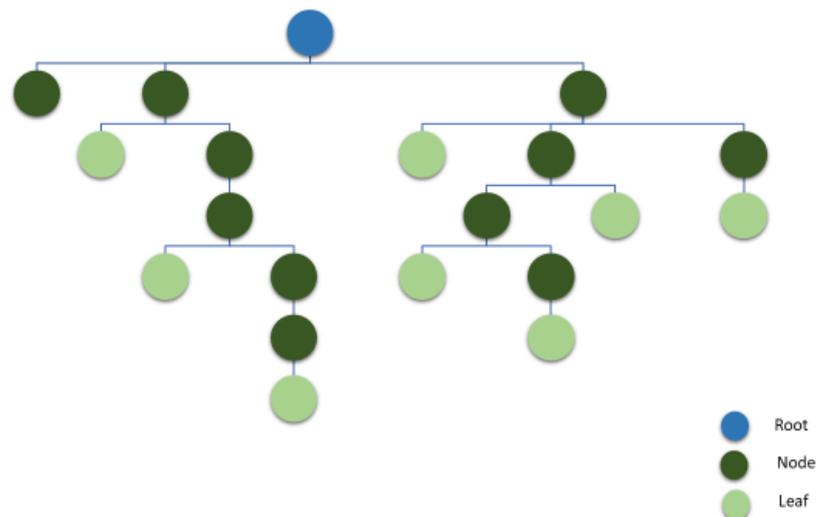
INTRODUCTION

An Unbalanced Hierarchy is a new special type of Entity which supports defining parent-child relations between its members. In an Unbalanced Hierarchy, data is aggregated on the fly along the hierarchy. These structures are typically used in financial reporting or in organization structures and are common to many other business models.

All items are members of the same entity. Each item can have multiple children but one parent only. Items that don't have any children below are called leaves and can store data. Items that don't have parents are called roots.

Each unbalanced hierarchy will be represented through a tree with the following constraints:

- A node cannot have multiple parents
- A node can have n children
- There must be no cycles
- Orphans (nodes with no parents) are to be connected directly to the root



ENTITY CREATION

The unbalanced hierarchy is managed in a single Board entity, while creating it you need to activate the option “Unbalanced hierarchy” in the properties.

OPTIONS CONTENT ANALYSIS

ENTITY

Name *
Account

Group *
01-Account

Code width
20

Desc width
50

Max item number
1000

Sort by
None ▼

Members display
Description ▼

Allow user in view

Is rollup entity

Unbalanced hierarchy

DATA LOADING

Bulk loading (Data reader)

In order to load the data into an "unbalanced hierarchy" entity you should use a datareader.

The entity is composed of 3 elements (Code, Desc & The Parent Code) instead of the 2 usual elements (Code & Desc).

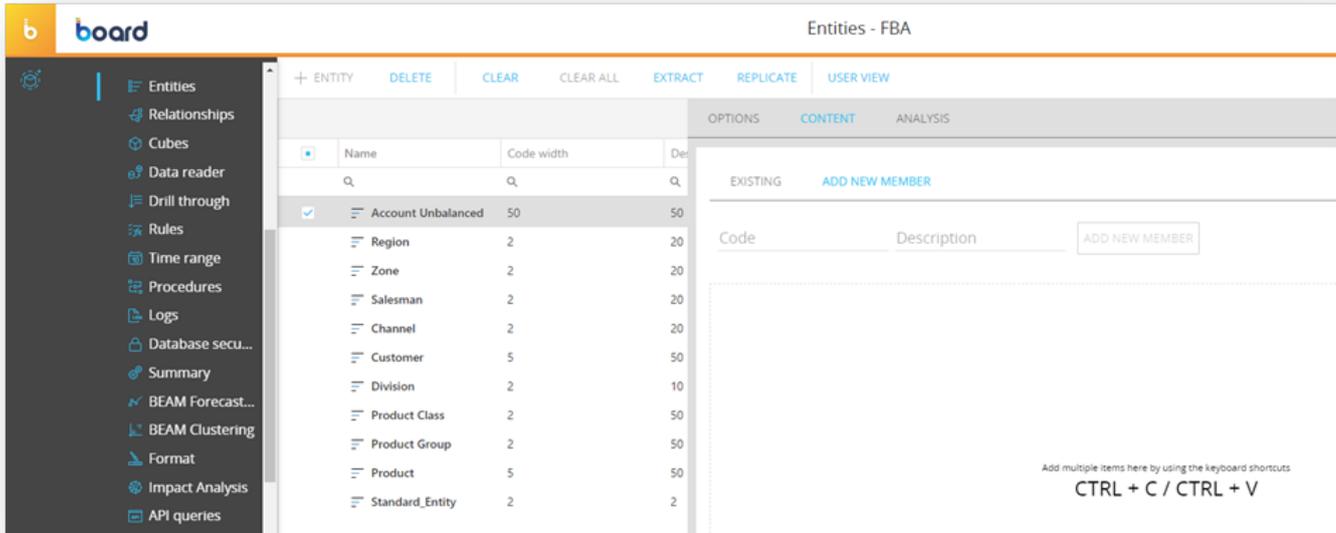
The screenshot shows the 'DATA READER' interface for 'Load_Account_Unbalance'. On the left, a tree view shows the entity structure under '01-Account', with three 'Account Unbalanced' items checked. The main area displays a 'MAPPING' table with the following data:

Field	Field	Mode
# Account Unbalanced	Code enfant	ADD NEW ITEM
≡ Account Unbalanced	Desc enfant	REPLACE
🔍 Account Unbalanced	Code parent	

Note: In purpose, there's no "ADD NEW ITEM" mode in the mapping of the parent's code. So please make sure that all the parents are present in the "Child Code" field and connect them to the root in the "parent code" field.

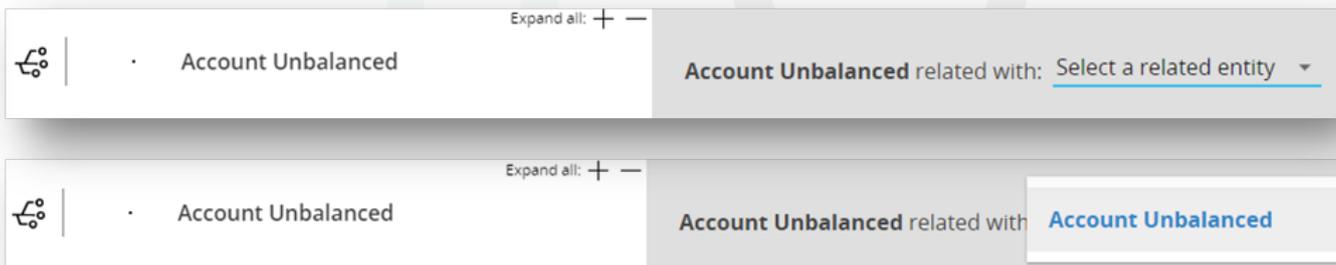
Manual adding members/Relationships

Adding new members into an unbalanced hierarchy Entity is similar to adding to a standard Board Entity. You can either enter the code & desc then add the new member one by one or past or by copy/past in the zone bellow to add multiple items at once.

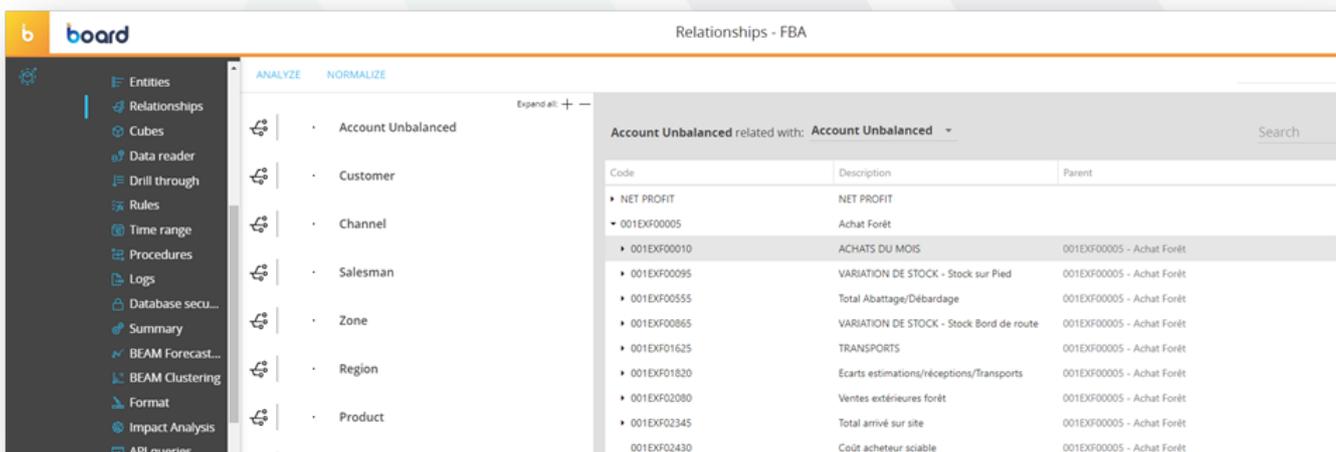


Once the new members are added, you need to go to the “Relationships” tab to set their parents inside the unbalanced hierarchy.

Go to the “Relationships” tab > Click on the Entity name > then click on ‘Select a related entity’ and chose the unbalanced entity itself.



The tree appears, you can now navigate and set/modify the relationships. Only the direct parent is to be set/modified, the rollup then get all the levels recursively.

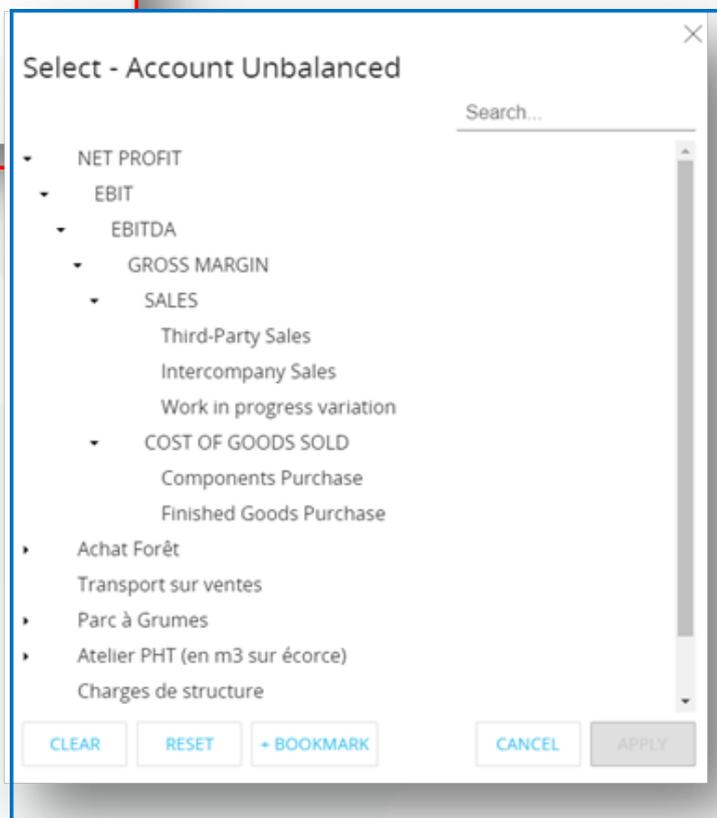
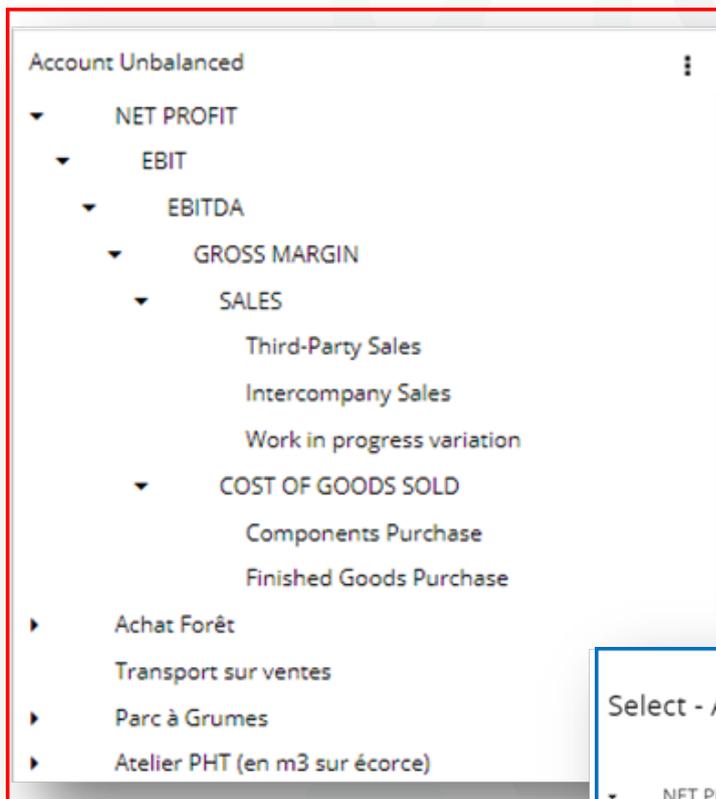


APPLICATION DESIGN

Selection

In the screen selection (both **Vertical list** & **Pop-up window**), entities will be displayed in a tree structure.

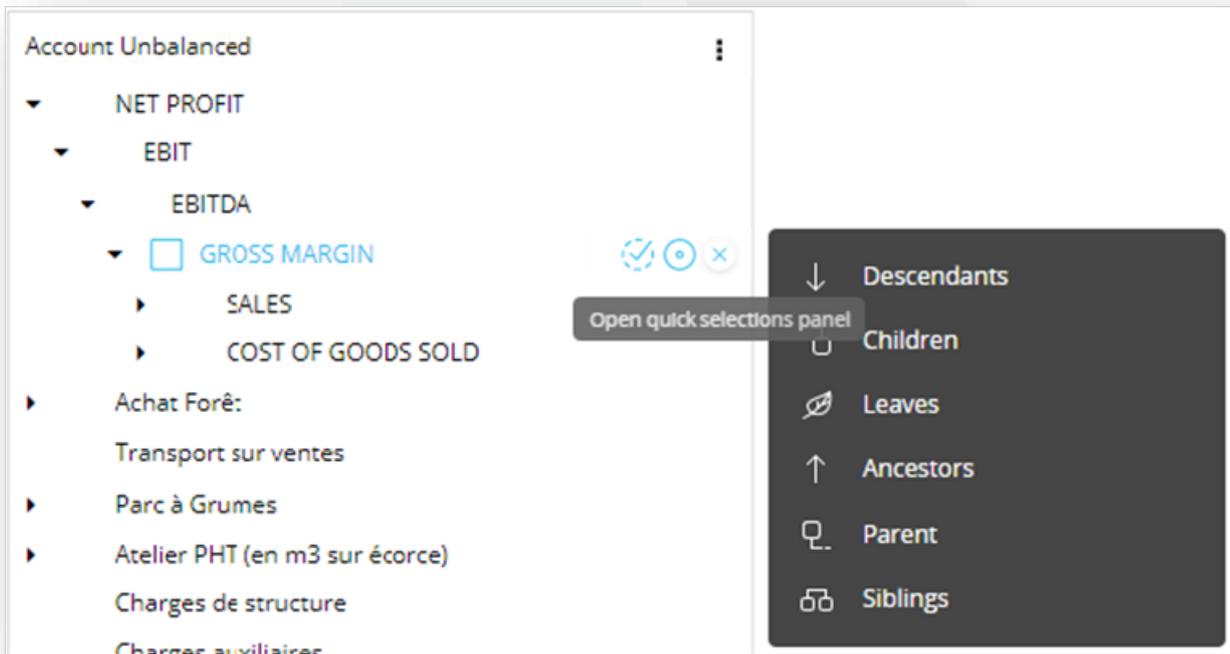
The user has the freedom to navigate through the hierarchy by expanding the nodes.



Opening the selection on the entity, if there is no selection, only the first (highest) level will be displayed in the window. if a selection exists, the tree will be exploded on the hierarchical elements.

the Search function allows you to find an element within the hierarchy. the search result will show the exploded tree to show the correct position of the element in the hierarchy

Selection: The selection can be simply applied only on the selected element, or it can be propagated on parent, children or siblings elements.



You'll find bellow examples of each selection option :



Data visualization

In order to view the data through an unbalanced hierarchy, you do not need to activate any options, simply drag & drop the Entity (unbalanced hierarchy) in the "By Row" axes.

By default, the cubes structured by an unbalanced entity will be displayed using this "unbalanced hierarchy" logic.

P&L Report £'000	
NET PROFIT	-2,870
EBIT	41,042
EBITDA	63,038
GROSS MARGIN	64,674
SALES	71,396
Third-Party Sales	50,097
Intercompany Sales	20,220
Work in progress variation	1,079
COST OF GOODS SOLD	-6,723
Components Purchase	-100
Finished Goods Purchase	-20

Rollup happens automatically to all parent levels. If Data is loaded on any parent levels, it will be ignored and replaced by the rollup calculation when the unbalanced hierarchy option is enabled.

It is possible to configure a Rule on an unbalanced hierarchy, in this case, the Rule's formulas overwrite the rollup calculation when the Rule is selected in the Cube block.

As for the Column Algorithm, the calculations are done at the leaf level and then the unbalanced rollup is applied on the parent levels.

However, the unbalanced display mode can be disabled for a cube block by activating the "Rules" then checking the option "Disable unbalanced hierarchy". In this case, the dataview will show all the elements in a flat mode and only the data stored in the cube (+ the calculation of rules if any).

The screenshot shows the FAST CUBE interface with the following details:

- Settings:** BY ROW: Account Unbalanced; BY COLUMN: (empty); SCREEN: Month = Jan.22, Feb.22, Mar.22; LAYOUT: (empty).
- DATA VIEW:** PnL; Infocube; Disable unbalanced hierarchy (button).
- Account Hierarchy (Left Panel):**
 - NET PROFIT
 - EBIT
 - EBITDA
 - GROSS MARGIN
 - SALES
 - Third-Party Sales
 - Intercompany Sales
 - Work in progress variation
 - COST OF GOODS SOLD
 - Components Purchase
 - Finished Goods Purchase
 - Achat Forêt
 - ACHATS DU MOIS
 - Total sciable
 - Epicea commun
 - Epicea de Sitka
 - Sapin Pectine
 - Sapin Grandis
 - Pin maritime
- Rules Panel (Right):**
 - Disable unbalanced hierarchy
 - Apply on totals
 - Rollup

Filter & Drill

Screen selection and filters can be applied on the unbalanced hierarchy members in order to show only some relevant elements in some cases. However, no matter the selection applied (on the entity itself) the rollup calculation ignores the selection (ignores only the selection on the entity itself, all the other selections and filters are not ignored) to take in account all the elements including the filtered ones.

In the example bellow, on the left no selection is applied, on the right only the accounts "Net Profit, EBIT, EBITDA & Goss Margin" are selected. We can see that the aggregated values are equal with or without filters.

PnL	
NET PROFIT	1 265
EBIT	1 265
EBITDA	1 265
GROSS MARGIN	1 265
SALES	1 140
Third-Party Sales	420
Intercompany Sales	720
Work in progress variation	
COST OF GOODS SOLD	125
Components Purchase	
Finished Goods Purchase	125
Achat Forêt	
ACHATS DU MOIS	
Total sciable	
Epicea commun	
Epicea de Sitka	
Sapin Pectine	
Sapin Grandis	
Pin maritime	

PnL	
NET PROFIT	1 265
EBIT	1 265
EBITDA	1 265
GROSS MARGIN	1 265

This being said, it is possible to filter the reporting on only few key indicators and then use the Drill feature to dive into the different levels of the hierarchy.

Drilling on an element of an unbalanced hierarchy will show only the children of the next level, then we can keep drilling down until get to the leaf level.

In the example bellow :

- The drill on the GROSS MARGIN shows its direct children "SALES" & "COST OF GOODS"
- The drill on the SALES shows its direct children that are also leaves.

The screenshot displays a financial reporting interface with a main P&L table and two drill-down windows. The main table lists various financial metrics and their values. The first drill-down window, titled "Drill down by Account Unbalanced", shows the breakdown of GROSS MARGIN into SALES (1,140) and COST OF GOODS SOLD (125). The second drill-down window, also titled "Drill down by Account Unbalanced", shows the breakdown of SALES into Third-Party Sales (420), Intercompany Sales (720), and Work in progress variation.

PnL	
NET PROFIT	1 265
EBIT	1 265
EBITDA	1 265
GROSS MARGIN	1 265
SALES	1 140
Third-Party Sales	420
Intercompany Sales	720
Work in progress variation	
COST OF GOODS SOLD	125
Components Purchase	
Finished Goods Purchase	125
Achat Forêt	
ACHATS DU MOIS	
Total sciable	
Epicea commun	
Epicea de Sitka	
Sapin Pectine	
Sapin Grandis	
Pin maritime	

PnL	
NET PROFIT	1 265
EBIT	1 265
EBITDA	1 265
GROSS MARGIN	1 265

PnL	
SALES	1 140
COST OF GOODS SOLD	125

PnL	
Third-Party Sales	420
Intercompany Sales	720
Work in progress variation	

Data Entry & Locks

Data Entry

To start, the data entry is available at the leaf level only.

PnL	Jan.22	Feb.22	Mar.22
NET PROFIT			
EBIT			
EBITDA			
GROSS MARGIN			
SALES			
Third-Party Sales			
Intercompany Sales			
Work in progress variation			
COST OF GOODS SOLD			
Components Purchase			
Finished Goods Purchase			
Achat Forêt			
ACHATS DU MOIS			
Total sciable			
Epicea commun			
Epicea de Sitka			
Sapin Pectine			
Sapin Grandis			
Pin maritime			

To can unlock the data entry on the parent levels, two conditions should be verified :

- The values are different than zero at least for one leaf member
- The option Split & Splat is enabled

When Data entry is enabled on parent levels, the new value will be proportionally distributed immediately following the split & splat logic on all the leaves under the level where the value is entered. No data will be stored on any parent level.

In this example, we increased the value of the **NET PROFIT** by 100%, we can see that all the **leaves** were increased by 100%. After saving this modification, the new values of the leaves will be stored in the cube and the values of all the parents will be recalculated in Rollup.

PnL	Jan.22	Feb.22
NET PROFIT	790	
EBIT	790	
EBITDA	790	
GROSS MARGIN	790	
SALES	350	
Third-Party Sales	100	
Intercompany Sales	120	
Work in progress variation	130	
COST OF GOODS SOLD	440	
Components Purchase	210	
Finished Goods Purchase	230	
Achat Forêt		
ACHATS DU MOIS		
Total sciable		
Epicea commun		
Epicea de Sitka		
Sapin Pectine		
Sapin Grandis		
Pin maritime		

PnL	Jan.22	Feb.22
NET PROFIT	1 580	
EBIT	1 580	
EBITDA	1 580	
GROSS MARGIN	1 580	
SALES	700	
Third-Party Sales	200	
Intercompany Sales	240	
Work in progress variation	260	
COST OF GOODS SOLD	880	
Components Purchase	420	
Finished Goods Purchase	460	
Achat Forêt		
ACHATS DU MOIS		
Total sciable		
Epicea commun		
Epicea de Sitka		
Sapin Pectine		
Sapin Grandis		
Pin maritime		

Locks

Data entry lock (based on a cube or directly with the dataview lock functionality) can be applied both on leaf level and parent levels. When it's applied on a leaf, the split & splat function recalculated only the unlocked leaves (see example below).

	PnL_Lock	PnL
NET PROFIT	<input type="checkbox"/>	720
EBIT	<input type="checkbox"/>	720
EBITDA	<input type="checkbox"/>	720
GROSS MARGIN	<input type="checkbox"/>	720
SALES	<input type="checkbox"/>	600
Third-Party Sales	<input type="checkbox"/>	100
Intercompany Sales	<input type="checkbox"/>	200
Work in progress variation	<input checked="" type="checkbox"/>	300
COST OF GOODS SOLD	<input type="checkbox"/>	120
Components Purchase	<input type="checkbox"/>	50
Finished Goods Purchase	<input checked="" type="checkbox"/>	70

	PnL_Lock	PnL
NET PROFIT	<input type="checkbox"/>	1 440
EBIT	<input type="checkbox"/>	1 440
EBITDA	<input type="checkbox"/>	1 440
GROSS MARGIN	<input type="checkbox"/>	1 440
SALES	<input type="checkbox"/>	1 217
Third-Party Sales	<input type="checkbox"/>	306
Intercompany Sales	<input type="checkbox"/>	611
Work in progress variation	<input checked="" type="checkbox"/>	300
COST OF GOODS SOLD	<input type="checkbox"/>	223
Components Purchase	<input type="checkbox"/>	153
Finished Goods Purchase	<input checked="" type="checkbox"/>	70

On the other hand, applying a lock on a parent level will freeze the current value and recalculate the leaves to keep the parent value unchanged.

In the example below, the parent SALES is locked, so any change on one or more of its children will recalculate the other not locked children in order to allocate its frozen current value.

	PnL_Lock	PnL
SALES	<input checked="" type="checkbox"/>	600
Third-Party Sales	<input type="checkbox"/>	100
Intercompany Sales	<input type="checkbox"/>	200
Work in progress variation	<input checked="" type="checkbox"/>	300

×	PnL_Lock	PnL
SALES	<input checked="" type="checkbox"/>	600
Third-Party Sales	<input type="checkbox"/>	120
Intercompany Sales	<input type="checkbox"/>	180
Work in progress variation	<input checked="" type="checkbox"/>	300

CONCLUSION

The unbalanced hierarchy is a very powerful and useful feature. It allows to dynamically add levels in any branches of the hierarchy without any impact on the reports or data entry screens. It's easy to configure and offer a lot of flexibility in term of use.

However, following the Board development best practice, we would like to avoid ending up with many unbalanced hierarchies in a single data model just to avoid managing classic hierarchies. A classic hierarchy is preferred to be used when the use of an unbalanced one isn't necessary.