

United Nations

Corporate Guidance

For

**International Public Sector Accounting
Standards**

Inventories

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Corporate Guidance to Support the Adoption of International Public Sector Accounting Standards (IPSAS) by the United Nations

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Corporate Guidance # 4 - Inventories

This corporate guidance will cover the following topics with respect to inventory:

- Guidance on recognition criteria – what constitutes inventory in the UN environment, where we provide services free of charge. Standard refers to inventory and related revenue recognition; and strategic stocks. Refer to inventory instructions in PwC room: **see section 4.1**;
- Guidance on how to cost work in process and raw material supplies, including overhead allocation, for inventories of publications etc. Need to link publications to intangibles as this is a new area the UN need clear understanding of which costs related to inventory and which relate to intangibles. (refer to UN system wide paper on inventory and intangibles): **see sections 6.1 and 3.2**;
- Guidance on the data elements that need to be captured to account for inventory in a non-automated environment (review non PKO template for completeness): **Reviewed for completeness and no major issues were identified**;
- Guidance on developing and validating standard cost methodology to facilitate the capture of associated costs (refer xxxxxxxx for PKO): **see section 6.1.1**;
- Guidance on inventory valuation; costs vs. net realizable value/replacement costs (how to do it, what evidence is required, include donations): **see sections 6.1 and 6.2**;
- Impairment – clear guidance on when and how much: **see sections 6.2.1 - 6.2.4**;
- Guidance on physical verification of inventories (refer to guidance on how to do verification) consignment , ownership v control: **see section 9.4.1**;
- Guidance on improving workflows/controls – stockcards to give reliable information: **see section 9.4.1**;
- Key Performance Indicators (KPIs): **see section 7.1**.

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1 Introduction

IPSAS 12 *Inventories* provides fundamental guidance surrounding the recognition, classification, measurement and disclosure requirements of inventory.

The guidance has been presented, along with “in practice” examples in order for the United Nations Secretariat (United Nations) to adopt and apply a comprehensive accounting treatment for inventory across its entities.

In order to properly account for inventory under IPSAS, it is important to understand the **life cycle** of inventory.

The inventory lifecycle consists of the follow processes:

- Acquisition;
- Inventory-In;
- Inventory-Out; and
- Physical verification.

At each stage of the life cycle, accounting and reporting takes place i.e. from the acquisition process, which forms part of the opening statement of financial position through to the physical verification process, which feeds into the closing balances.

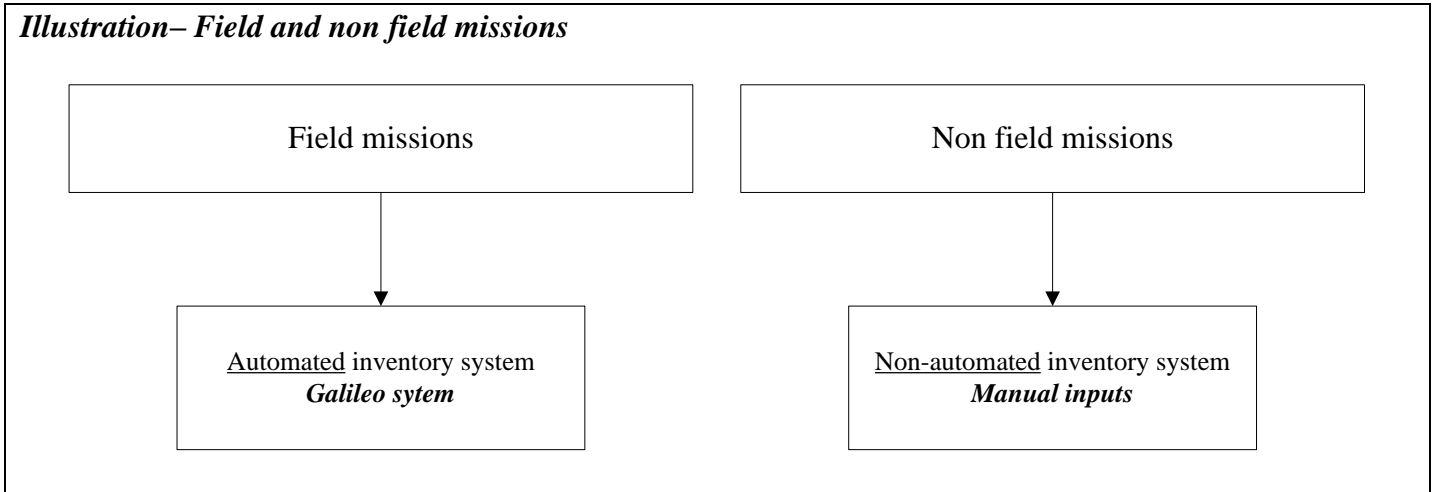
Illustration – Inventory lifecycle



Please note, **field missions** and **non field missions** currently manage their operations differently. Field missions use an automated inventory management system called Galileo to track, manage and report their inventories whilst non field missions are mainly reliant on excel spreadsheets until the implementation of Umoja.

For the purposes of this paper, the practices laid out are the minimum requirements for non field missions not having an automated system in place to capture the end to end life cycle of inventories. For field missions, it is assumed that Galileo will perform most of these processes in an automated fashion.

Refer to the illustration below for the inventory systems used in field and non field missions.



2 Definitions

IPSAS 12 definitions

Inventories are assets:

- In the form of materials or supplies to be consumed in the production process (e.g. ink to produce stamps sold by UNPA);
- In the form of materials or supplies to be consumed or distributed in the rendering of services (e.g. rations distributed in field missions);
- Held for sale or distribution in the ordinary course of operations (e.g. souvenirs sold by ICTY and stamps sold by UNPA); or
- In the process of production for sale or distribution (e.g. semi finished publications).

Current replacement cost is the cost the United Nations would incur to acquire the asset on the reporting date.

Net realizable value is the estimated selling price in the ordinary course of operations, less the estimated costs of completion and the estimated costs necessary to make the sale, exchange, or distribution.

United Nations specific definitions

The United Nations IPSAS Policy Framework outlines the following definitions of inventories:

Operational inventory refers to items maintained in storage and not consumed/used directly upon receipt. Operational inventory can be either financial or non-financial in nature.

Financial inventories will be reported in the IPSAS statement of financial position as a current asset until used, sold, or distributed, at which point it will be expensed.

Non-financial inventories are materials and supplies consumed internally for the United Nation's own use. Non-financial inventory will be expensed on acquisition.

Other definitions

The **cost of inventory** is comprised of:

- Purchase price (or fair value if donated in-kind);
- Costs of conversion; and
- Other costs incurred in bringing the inventories to their present location and condition should be included.

Conversion costs are the costs required to convert purchased materials into finished inventory (e.g. labour, materials, and overhead).

Associated costs are costs, other than purchase price or conversion costs, which are incurred in bringing inventory to its present location and condition (e.g. freight, import duties, insurance).

The **moving average price** “MAP” method is a method of determining the cost of inventory by re-calculating the average cost of each inventory item after every inventory purchase (see section 6.3 for an example).

The **weighted average price** “WAP” method is a method of determining the cost of inventory by assigning a weighted average to both ending inventory and cost of goods sold. The weighted average is calculated by:

$$\text{WAP} = \frac{\text{Costs of good available for sale or distribution (sum of beginning inventory and net purchases or production)}}{\text{Number of units available for sale or distribution}}$$

The result of using WAP is that the recorded amount of inventory on hand represents a value somewhere between the oldest and newest units purchased into stock. Similarly, the cost of goods sold reflects a cost somewhere between that of the oldest and newest units sold during the period (see section 5 for an example).

A **perpetual** inventory system keeps up-to-date records of inventory balances on an ongoing basis by using the moving average price of inventory “MAP” (e.g. Umjjoa).

A **periodic** inventory system only collects inventory information at the end of an accounting period and determines the cost of inventory using the weighted average price “WAP” (e.g. through a physical count).

An **automated inventory system** is a system used to keep track of inventory on an on-going basis (e.g. Galileo).

A **non automated inventory system** is a system that manually tracks inventory (e.g. Excel spreadsheet).

Fixed production overhead costs are those indirect costs of production that remain relatively constant regardless of the volume of production, such as depreciation and maintenance of factory buildings and equipment, and the cost of factory management and administration.

Variable production overhead costs are those indirect costs of production that vary directly, or nearly directly, with the volume of production, such as indirect materials and indirect labor.

An inventory item may be considered **obsolete** when it no longer has future economic value, service potential, or has been replaced by an updated version.

A **write-off** is a decrease of 100% of the carrying value of an inventory item due to obsolescence, damage, or expiration (see case study 9.2 for example).

A **write-down** is a partial decrease of the carrying value of an inventory item when it is determined that the cost of the inventory exceeds its net realizable value (if inventory is held for sale) or current replacement cost (if inventory is distributed for free or for a nominal value) (see case study 9.1, 9.2, and 9.3 for examples).

3 Classification

3.1 Inventory classes and sub-classes

Based on the United Nation’s scope of inventories and the recognition criteria, the following classes and sub classes of inventory have been defined as **financial inventories**. In addition, strategic supplies and reserves will also be regarded as financial inventories.

Inventory Class	Sub class
Held for sale	<ul style="list-style-type: none"> • Books and Publications • Stamps • Liquor • Other
Consumables and Supplies	<ul style="list-style-type: none"> • Fuel - strategic and local reserves • Oil and lubricants • Medical and emergency supplies • Rations • Office supplies • Ammunition • Uniforms and badges • Safety and security supplies • Motor vehicle spare parts • Electrical spare parts • Other spare parts
Raw Materials and Work in progress	<ul style="list-style-type: none"> • Printing supplies • Construction material and supplies • Work in progress

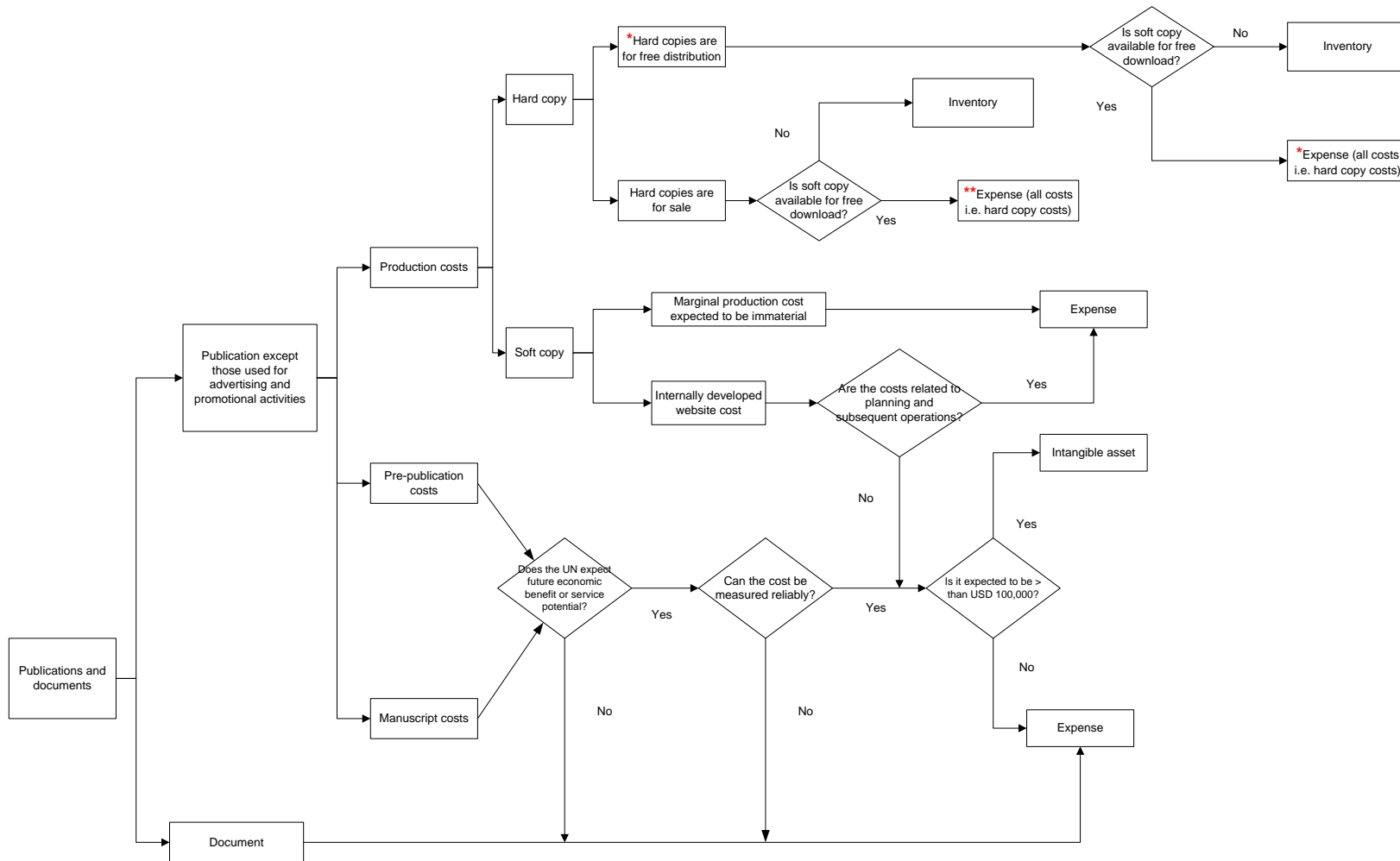
3.2 Documents and publications.

Since its founding, written words have been central to articulating the aspirations of the United Nations. The United Nations and its key agencies have over 5,300 titles produced. The website offers on-line access to the United Nations complete catalogue, in a range of formats including print, electronic and multimedia.

Costs incurred to come up with these documents and publications raises questions as to how the costs will be accounted for under IPSAS. This section provides an overview on how documents and publications are managed at the United Nations along with guidance on how to account for costs incurred at various stages.

Please refer to the flowchart “Accounting treatment of publications” on the following page for an overview on recognition of costs relating to documents and publications. Although this paper primarily focuses on accounting for inventory please refer to Corporate Guidance paper #12 *Intangible Assets* for detailed guidance on accounting for intangible assets.

Flowchart – Accounting treatment of publications



* Hard copies for free distribution should be expensed if the softcopy is available for free download; otherwise they should be treated as Inventory

** Based on past experience, the United Nations believes that the value of hard copy publications for sale is reduced significantly if the soft copies are available for free download, accordingly the United Nations has opted to expense hard copy costs if soft copies are available for free download.

3.2.1 Documents

Documents include General Assembly resolutions, Security Council meeting agenda and minutes, annual reports of the Secretary-General, International Court of Justice proceeding transcripts, and international treaties.

Documents are generated as part of the day-to-day operations of the United Nations and represent mandatory activities of the organization. Consequently, these documents cannot be viewed as separate from the operations of the United Nations. The documents are under copyrights and can be obtained without any cost as per Bern Convention.

Examples of costs incurred to generate proceeding transcripts at International Court of Justice or Security Council meeting agenda and minutes include:

- Salaries and benefits of judges and court staff;
- Expenditure incurred by the court during the trial;
- Traveling cost for meetings; etc.

Accounting for costs incurred to create documents:

The costs incurred to create a document cannot be recognized as inventory or an intangible asset.

Accordingly the cost should be **expensed as incurred**.

3.2.2 Publications

Publications include:

- Books and reports;
- Periodicals;
- Working papers; and
- Databases.

Publications are distributed in hard copy (book) and/ or soft copy (digital) form. Publications are copyrighted, and are sometimes available for free depending on decisions by the author's department, but are always available for sale (commercially). Some publications are composed as a collection of documents, packaged with connective tissue such as a foreword, introduction, table of contents, index, etc. to make the documents more accessible.

Examples of publications include:

- Risk Management in Regulatory Framework;
- 20 Years of Action for Global Environment;
- Law of the Sea Bulletin (issued three times a year);
- Asia-Pacific Population Journal (issued twice a year); and
- Report on World Social Situation 2013: Inequality Matters.

Publications may also act as advertising and promotional material for the United Nations activities. The costs related to those publications are always expensed as incurred.

Expenses incurred to create a publication are broadly classified into three stages at the United Nations:

- Preparation of manuscript,
- Pre-publication cost, and
- Production costs.

3.2.2.1 Preparation of a manuscript

A manuscript is referred to as an original copy of a work written by an author or composer. Copyright is a legal concept that gives the creator of an original work the exclusive right to copy it, be credited for it and benefit financially from it. In circumstances where a work is produced under a contract of employment as a work for hire, the holder of the copyright is the employer and not the author. The copyright holder is entitled to enforce his rights. These rights are characterized as publishing rights.

United Nations holds the publishing rights for its publications, and consequently can exploit the rights in various ways.

Examples of costs incurred at this stage include:

- Cost incurred to compile various tribunal decisions into a publication. Involves deleting references to names of parties, deleting some language from recordings are trial etc.
- Cost incurred to make a video publication after retracting the video recorded during the court trial. This includes editing, deleting the original video etc.

Accounting for costs incurred to create a manuscript:

IPSAS 12 *Inventories* identifies publications as a type of inventory held in the public sector and provides guidance on elements of the cost of inventories generally. It does not, however, address the issue of how to report the significant development costs of publications, many of which are intangible in nature. IPSAS 31 *Intangible assets* provides guidance on internally-generated intangible assets and development costs that may be capitalized generally but does not provide specific guidance on publications.

In the United Nations context the author and composer are in-house; accordingly the **United Nations has publishing rights** which can be exploited further in various ways like printed hard copy (book) format, soft copy (digital) format, specific languages, etc.

Since the United Nations has control over the manuscript it meets one criterion for recognition of intangible assets.

Additionally for a manuscript to be recognized as intangible asset the United Nations should also expect future economic benefits or service potential from the manuscript. IPSAS 31 states the future economic benefits or service potential flowing from an intangible asset may include revenue from the sale of products or services, cost savings, or other benefits resulting from the use of the asset by the entity. If the publication is used to deliver goods and services in accordance with the United Nations objectives then the publication can be considered as embodying service potential.

Further, intangible assets can only be recognized if the cost of the manuscript can be reliably determined and the \$100,000 threshold for internally generated intangibles is met. Tracking the costs for each manuscript can be difficult and impractical considering that there is a team of in-house authors working on multiple manuscripts at one point in time. Accordingly, the benefit of tracking the marginal cost for the manuscript that can be capitalized may exceed the benefits. However, if the costs can be reliably measured, then they would be eligible for capitalization as an intangible asset.

The costs incurred to create a manuscript cannot be considered as inventory because inventories include tangible assets whereas a manuscript represents an original copy of a work written by an author or composer.

3.2.2.2 Pre-publication costs

Pre-publication assets represent direct costs incurred in the development of manuscript **prior** to their publication.

Expenses incurred to create publications from manuscripts include:

- Typesetting of manuscript into composed pages;
- Manipulation of images, tables and charts to standardized format;
- Copy reads'; and
- Proofreads.

Subsequent to the incurrence of pre-publication costs, the publication can be produced in either hard copy (book) or soft copy (digital) form. Only after this stage a publication is in the form that it can be sold or distributed.

Accounting for costs incurred at pre-publication stage:

The costs incurred at this stage are incurred once for each publication and are incurred irrespective of the number of copies to be printed or the manner of distribution. Until this stage is complete a publication cannot be categorized as held for sale or distribution in the ordinary course of operations, consequently the cost incurred at this stage should not be considered as inventory.

Under IPSAS, pre-publication costs are considered intangible assets and can be recognized as intangible assets in which the publication will:

- Generate probable future economic benefits or service potential;
- Costs can be measured reliably; and
- Meets the United Nations threshold of \$100,000 for internally generated intangible assets.

3.2.2.3 Production costs

A publication can then be produced either in hard copy (book) or soft copy (digital) form.

1. *Hard copy (book)*

Publishing a hard copy (book) includes cost of printing, packing, paper, binding, etc.

Accounting for costs incurred to publish hard copy book:

IPSAS 12 *Inventories* states that inventories include goods produced for sale or for distribution at no charge or nominal charge. Accordingly, cost of producing hard copy (books) will be accounted for as inventory.

Measurement is based on whether inventory is available for sale or distributed for no or nominal charge:

- Available for sale:
 - i. If the book is available for free download, the book is expected to generate a minimal amount of revenue therefore the United Nations has concluded these hardcopy costs should be expensed.
 - ii. If the book is not available for free download, the hardcopy costs are inventory and measured at the lower of cost or net realizable value.
- Available for distribution for no or nominal charge:
 - i. If the book is available for free download, the hard copy costs should be expensed
 - ii. If the book is not available for free download, the hard copy costs are inventory and measured at the lower of cost or current replacement cost.

If the purpose for which the inventory is held changes, then the measurement should change accordingly.

2. *Soft copy (digital)*

- Production costs for the publication in soft copy (digital) includes cost incurred to make a publication distributable in soft copy form. The additional cost is very minimal it should accordingly be expensed as incurred.
- Accounting for the costs of developing online platforms (Websites) to provide publications:
 - **For externally acquired websites**, the payments made represent the cost of the website and must be recognized as an intangible asset.
 - **If the website is developed by the United Nations itself**, the costs of the planning phase must be recognized as an expense when they are incurred. However, costs incurred for infrastructure, graphic design, and content development (apart from content developed to advertise) for a website must be recognized as an intangible asset. Costs incurred during the subsequent operation of the website must be recognized as an expense.

Refer to the example below for examples of costs incurred at the United Nations:

Example – Treatment of publication related costs at the United Nations

We refer to the flowchart “Accounting treatment of publications” in the beginning of this section for further details.

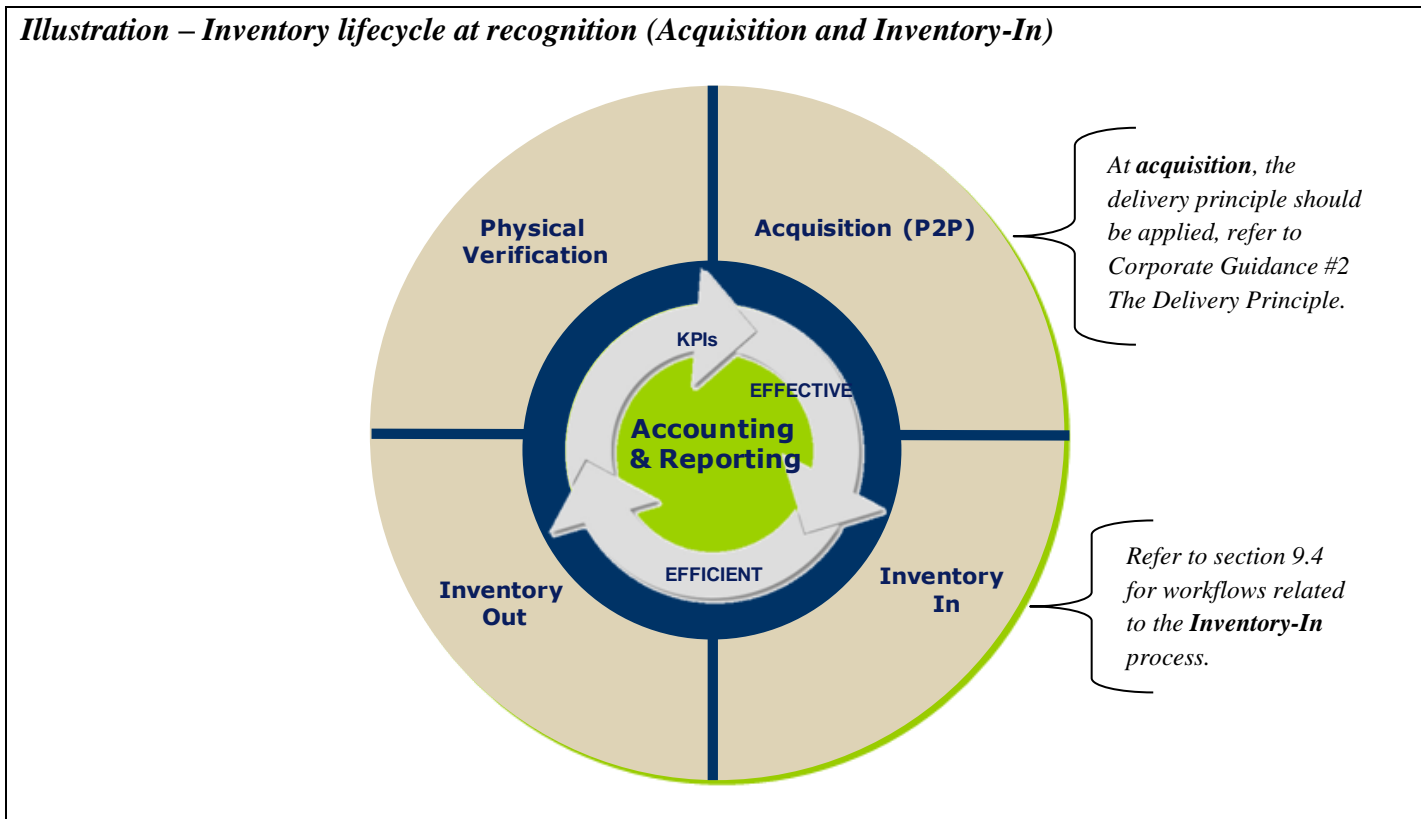
Publications may also act as advertising and promotional material for the United Nations activities. The costs related to those publications are always expensed as incurred.

Type of cost	Accounting treatment
Marketing and advertising costs for publications	Expense
Paper and printing supplies	Hard copy production costs (inventory/ expense)
Salaries and benefits of staff involved in printing	Hard copy production costs (inventory/ expense)
Outsourced printing services	Hard copy production costs (inventory/ expense)
Salaries and benefits of staff editors and proofreaders	Pre-publication costs (intangible/expense)
Editorial services and translation services	Pre-publication costs (intangible/expense)
Salaries and benefits of staff writers and designers	Manuscript costs (intangible/expense)
Legal or other fees to register and/or defend copyright	Manuscript costs (intangible/expense)

4 Recognition

4.1 Inventory recognition

Recognition plays a pivotal role in the lifecycle of inventory. The “acquisition” and “Inventory-In” processes are directly related to the recognition of inventory. Refer to the illustration below.



Upon acquisition, the United Nations should initially recognize inventory when it has **control** of the item (timing and recognition).

The terms of delivery (Incoterms and specific arrangement's terms) should be examined to determine when significant risks and rewards of ownership have been transferred to the United Nations. We refer to Corporate Guidance #2 on the delivery principle for a more detailed discussion.

Inventory must meet the all of the following criteria in order to be recognized:

- The United Nations has control over the asset;
- It is probable that future economic benefits or service potential associated with the item will flow to the United Nations; AND
- Value of the asset can be reliably measured.

Once it has been determined that inventory can be recognized, an assessment should be made as to the type of inventory being acquired. As discussed, all items maintained in storage and not consumed directly upon receipt are considered **operational inventory**. Operational inventory can be either **financial** or **non-financial** in nature.

Financial inventory is a sub set of operational inventory and is defined as:

- Materials or supplies stocked exclusively for direct input into the production of items for sale or distribution to parties outside of the reporting entity (e.g. paper used in the publication printing process);
- Items held for sale or distribution to parties outside of the reporting entity (e.g. publications held for sale);
- Work in progress balances relating to items for sale or distribution to parties outside of the reporting entity (e.g. work in progress related to stamps held for sale); or
- Centrally managed strategic stocks (e.g. Strategic Deployment Stock “SDS” and strategic holdings of fuel and rations held by field missions).

Financial inventories will be reported in the IPSAS statement of financial position as a current asset until used, sold, or distributed, at which point it will be expensed.

Non-financial inventories are materials and supplies consumed internally for the United Nation’s own use. Non-financial inventory will be expensed on acquisition.

During the **Inventory – In** process of the life cycle, it is important to ensure proper internal controls are being followed so that accurate recognition is determined (Refer to workflows in section 9.4):

- Segregation of duties (e.g. appoint individuals who are independent of the daily custodianship of inventory);
- Inventory issued in should be compared against the good receipts note and purchase order; Both manual and electronic stock cards should be updated accordingly (note that stock cards are auditable documents and should be properly maintained); and
- The corresponding systems should also be updated.

5 Inventory for opening IPSAS statement of financial position

The adoption of IPSAS requires an opening statement of financial position as of January 2014 for non-field missions. Inventories are measured at historical cost in the opening statement of financial position. For purposes of determining opening inventory balances, the United Nations should use the follow methods based on their classification as either field or non-field missions.

For **field missions** using Galileo to manage their inventories through the end to end inventory life cycle, the IPSAS opening statement of financial position at the 1st of July 2013, will be determined automatically from acquisitions carried over from the previous year, and receipts and issuances made during the year. Galileo values inventory based on the perpetual moving average price “MAP” and consequently, the opening balances should be IPSAS compliant. Balances should be verified by comparing the balances in the system to the physical inventory on hand on a sample basis.

For **non-field missions** that do not have an automated system to manage inventories, the process of determining opening balances began by performing a physical verification count of inventories at 31 December, 2012. For an example of the physical verification process, refer to section 9.4.1.

For non-field missions, the inventory IPSAS opening statement of financial position plan for 2014 will:

- Use the results of the December 2012 physical verification in the opening statement of financial position as of 1 January 2013, using the last purchase price including associated cost;
- Track the purchase prices and associated costs of inventory throughout 2013 and at the year end, calculate a periodic weighted average price (refer to example below);
- Conduct another physical verification exercise for financial inventory as of 31 December 2013 and measure based on the year end periodic weighted average price; and
- The ending inventory balance in the 31 December 2013 statement of financial position, measured using the periodic weighted average method, will be the IPSAS compliant opening statement of financial position as of 1 January 2014.

Refer below for an illustration of the timeline related to opening inventory balances in the statement of financial position.

Illustration – Timeline for opening statement of financial position for non field missions



Whereas:

PVE: *Physical verification exercise;*

OBS: *Opening balances;*

PP: *Purchase price;*

WAP: *Weighted average price.*

The periodic weighted average price will be used until the Umoja go live date when the perpetual moving average method will be used. See below for an example of how the weight average price is calculated.

Example – Weighted average price “WAP”

As mentioned, the WAP method will be used to determine the cost of inventory until the Umjoo go live date.

Refer below for the application of the WAP method in the context of a field mission.

December, Year 1

- A field mission purchased 1,000 ration packs and recorded them in inventory at the following prices:

Purchases	Cost
500 units @ \$20	\$10,000
300 units @ \$22	6,600
200 units @ \$25	5,000
Total	1,000 units \$21,600

31 December, Year 1

- A periodic inventory count at the end of the reporting period reveals 200 packs remaining:

Weighted Average
<i>Total purchase price / Total units purchased = Weighted average price of each unit</i>
\$21,600 / 1,000 ration packs = \$21.60 weighted average cost per ration pack
Expense amount: \$17,280 [800 (1,000-200 rations remaining) x \$21.60 (weighted average cost)]
Balance on statement of financial position: \$4,320 [200 (remaining rations) x \$21.60 (weighted average cost)]

For non-field missions, it is critical that the closing balances provided as of 31 December 2013 accurately reflect changes to inventory throughout 2013. Familiarity with the inventory lifecycle and awareness of best practices related to each process will help ensure accuracy of opening statement of financial position:

- Acquisition (any new purchases in 2013);
- Inventory-In (refer to workflows);
- Inventory-Out (refer to workflows); and
- Physical verification (to be completed again at the end of 2013. See workflows, section 9.4).

In line with the life cycle, inventories acquired and issued into inventory during the year and issued out for sale or distribution make up the closing balances in the statement of financial position. Consequently, any physical movements of inventories, both in and out of inventory, should be reflected in systems used to monitor and track inventory.

It is also important to ensure that inventory balances in the opening balance sheet are tested for obsolescence (e.g. old publications, spare parts related to assets that are at the end of their useful lives, etc.) to ensure that they reflect assets with future economic benefits or service potential. Where obsolete items are identified, they should be disposed of and written off before the IPSAS go live date.

6 Measurement

Initial measurement of inventories should be at **cost** (i.e. purchase price plus associated costs).

Subsequent to initial recognition, inventories should be measured at the *lower* of **cost** and **net realizable value**, or **current replacement cost**.

6.1 Initial measurement

6.1.1 Measurement at cost

The initial **cost of inventory** is determined by the following elements:

- Purchase price (or fair value if donated in-kind);
- Costs of conversion; and
- Other costs incurred in bringing the inventories to their present location and condition should be included.

Associated costs are mandatory for both field and non-field missions. This cost will be derived by applying a standard cost methodology for field missions. Currently the rate at which field missions apply associated costs is 8.5% of purchase price, and will be reassessed on an ongoing basis.

Due to insufficient data, regarding associated costs, a standard cost methodology will not be applied to non-field missions. Consequently non field missions will account for associated costs at acquisition on an actual cost basis.

Examples of associated costs are freight, insurance, import duties, handling costs, etc.

6.1.1.1 Purchase cost

The **purchase cost** of inventories is comprised of:

- Purchase price;
- Import duties;
- Other taxes (other than those subsequently recoverable by the entity from the taxing authorities);
- Transport fee;
- Handling charges; and
- Other costs directly attributable to the acquisition of inventories.

Trade discounts, rebates and other similar items are deducted in determining the costs of purchase.

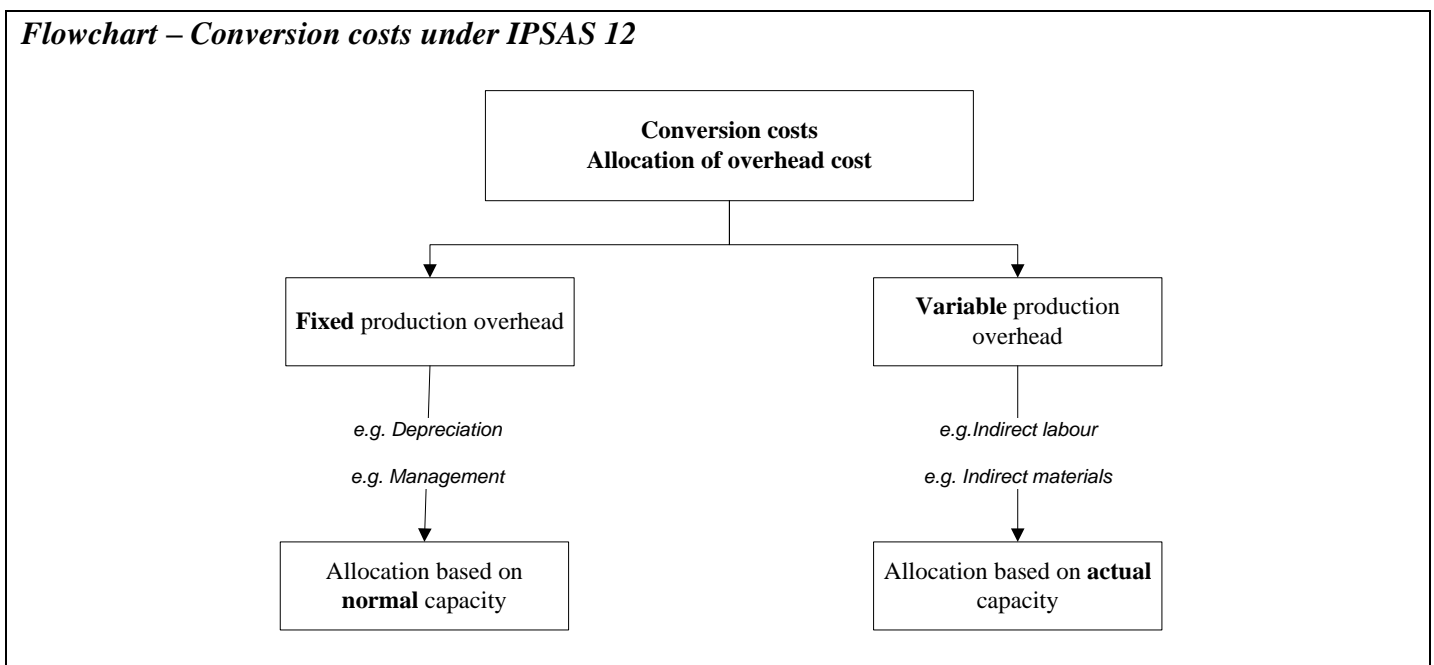
No in-country **transportation costs** will be capitalized unless part of the shipment charge is from vendors.

For example, if a field mission transports a particular item of inventory to another location or warehouse, then those costs would not be capitalized because they were not included in the invoice of the original shipment.

6.1.1.2 Conversion cost

The **costs of converting** work-in-progress inventories into finished goods inventories are incurred primarily in a manufacturing environment (e.g. printing publications), as stipulated in the Standard. The costs of conversion of inventories include costs directly related to the units of production, such as direct labor. They also include a systematic allocation of fixed and variable production overhead cost (refer to example below) that are incurred in converting materials into finished goods.

Refer to the flowchart below for the treatment of fixed and variable overhead production costs.



Fixed production overhead costs are those indirect costs of production that remain relatively constant regardless of the volume of production, such as lease payments and maintenance of factory buildings and equipment, and the cost of factory management and administration.

- As stipulated in the Standard, the allocation of fixed production overhead to the costs of conversion is based on the normal capacity of the production facilities. Normal capacity (e.g. workers maintain standard hours) is the production expected to be achieved on average over a number of periods under normal circumstances, taking into account the loss of capacity resulting from planned maintenance. The actual level of production may be used if it approximates normal capacity. The amount of fixed overhead allocated to each unit of production is not increased as a consequence of low production or idle plant. Refer to the example on the following page for how fixed production overhead costs are allocated based on normal production capacity.
- Unallocated overhead costs are recognized as an expense in the period in which they are incurred.
- In periods of abnormally high production, the amount of fixed overhead allocated to each unit of production is *decreased* so that inventories are not measured above cost.

Variable production overhead costs are those indirect costs of production that vary directly, or nearly directly, with the volume of production, such as indirect materials and indirect labor.

- Variable production overhead costs are allocated to each unit of production on the basis of the actual use of the production facilities.

Refer to the example on the following page to see how overhead costs, as incurred in the conversion process, are allocated at normal production levels.

Example – Allocation of overhead cost at normal levels

In order to effectively cost inventory, an understanding of the allocation of overhead costs should be considered. We will walk through the determination of fixed and variable overhead related to a product and how they impact the both the measurement of produced inventory and the financial statements.

Assume a production process related to publications runs at a normal capacity of 7,500 labour hours in a year (e.g. machine runs at standard capacity). The full capacity of the production process is 10,000 labour hours (i.e. overtime hours, weekend production, or add second shift). Refer to the steps below for an illustration how to allocate overhead costs to inventory at normal levels.

For the current year, there are 6,500 labour hours. Fixed production overhead is \$1,500 and total variable production overhead is \$2,600.

Inventory balance for the year:

<i>Opening</i>	2,500 units
<i>Produced</i>	6,500 units
<i>Sold</i>	<u>6,700 units</u>
<i>Ending</i>	2,300 units

Management should allocate **fixed overhead** costs and **variable overhead** costs to units produced at a rate of \$0.2 per hour and \$0.4 per hour respectively. See below for calculation.

- **Fixed production overhead absorption rate.**
= *fixed production overhead / labour hours for normal capacity*
\$ 1,500 / 7,500 = \$0.2 per hour.

Therefore, fixed production costs are allocated to the 6,500 units produced (one unit per hr)
= 6,500 × \$0.2 = \$1,300. The remaining \$200 unabsorbed fixed overhead is recognized as an expense.

The amount of fixed overhead allocated to inventory is not increased as a result of low production by using normal capacity to allocate fixed overhead.

- **Variable production overhead absorption rate.**
= *variable production overhead / actual hours for current period*
\$ 2,600 / 6,500 = \$0.4 per hour.

The above rate results in the allocation of all variable overheads to units produced during the year.

As each unit has taken 1 hour to produce (6,500 hours/6,500 units produced), total **fixed** and **variable** production overhead recognized as part of cost of inventory is:

= *number of units of closing inventory × number of hours to produce each unit × (fixed production overhead absorption rate + variable production overhead absorption rate)*

- $2,300 \times 1 \times (\$0.2 + \$0.4) = \mathbf{\$1,380}$

The remaining \$2,720 = [(\$1,500 + \$2,600) – \$1,380] is recognized as an expense in the statement of financial performance as follows:

- Absorbed in cost of goods sold = **\$2,520** [(6,500 – 2,300) × 0.6]
- Unabsorbed fixed overheads – expensed = **\$200**

6.1.1.3 Other costs

Other costs are included in the cost of inventories only to the extent that they are incurred in bringing the inventories to their present location and condition (e.g. costs of designing publications for specific customers).

6.1.1.4 Costs excluded from inventory

There are some costs that are **not** included in the cost of inventories, but are recognized as expenses in the period in which they are incurred:

- Abnormal amounts of wasted materials, labor, or other production costs, e.g.:
 - Due to a problem with a printing machine used for publications paper has been wasted. The wasted paper cannot be included in the measurement of the hard copy publications;
 - Abnormal fixed production overhead costs. See unabsorbed fixed overhead in the “Example – Allocation of overhead cost at normal levels” above;
- Storage costs, unless those costs are necessary in the production process before a further production stage;
- Administrative overheads that do not contribute to bringing inventories to their present location and condition; and
- Selling costs.

6.1.2 Measurement of fair value

Donated inventory is measured at fair value at acquisition date.

The following procedures are recommended to determine the fair value of donated inventory; they are ranked in descending order of best practice:

- Obtain a market price for similar inventory items;
- If market prices are not practically available, the office should reference recent acquisition costs for recent similar item;
- If prices cannot be obtained from the market or prior purchases data, then a solicitation to the donor as to the value should be made. Once the reasonableness of the data provided is assessed then it can be used as a representation of fair value;
- If not none of the above methods can be relied upon, an alternative procedure to determine the best value to assign to the inventory item needs to be identified. For example, inquiring from other similar agencies experiences in valuing such items in kind, which were donated to them and retain such inquiries as alternative proof of documentation for audit; or
- Lastly, if the inventory item in question is thought to have significant values, solicit the services of a third party valuation expert.

Fair value determination should be performed in cooperation between the Procurement Officer and the Finance Officer, as each may be able to provide specific elements required for determination of fair value.

6.2 Subsequent measurement

In accordance with IPSAS 12, *Inventories*, inventory held for sale are to be measured at the lower of cost and **net realizable value** (NRV) on an item-by-item or group basis. For example inventory type (paper of a certain size) or publication title.

Inventories held for distribution at no charge, or for a nominal charge, are to be measured at the lower of cost and **current replacement cost**. Refer to case studies in section 9.1, 9.2, and 9.3 for examples of subsequent measurement).

6.2.1 Inventory write-off / down

The amount of any **write-down** of inventories and all losses of inventories shall be recognized as an expense in the period the write-down or loss occurs in the statement of financial performance.

The amount of any **reversal of any write-down** of inventories shall be recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

Inventory costs may become unrecoverable when inventory has:

- Been damaged;
- Have become wholly or partially obsolete; **OR**
- If their selling price / replacement cost has declined.

A write-down occurs to reflect the unrecoverable portion of an item. A write-off occurs when it is determined the entire amount of the item is unrecoverable (see section 6.2.4 on obsolescence).

6.2.2 Net realizable value

Net realizable value refers to the net amount that the United Nations expects to realize from the sale of inventory in the ordinary course of operations (i.e. market price of a particular publication).

Inventory should be measured in the statement of financial position at the lower of **cost** and **net realizable value**, except where sections 6.2.3 and 6.2.4 apply.

If it is determined that the net realizable value of an inventory item is lower than its cost, the write-down of the item will be captured in the statement of financial performance as an expense.

Items not written down below cost are materials and other supplies held for use in the production of inventories if the finished products in which they will be incorporated are expected to be sold at or above cost.

A new assessment of an items net realizable value should be made in each subsequent period. If a circumstance that previously caused inventories to be written down below cost no longer exist or economic conditions have changed, the amount of the write-down is reversed (i.e., the reversal is limited to the amount of the original write-down).

6.2.3 Current replacement cost

Inventories are measured at the lower of cost and **current replacement cost** when they are held for:

- Distribution at no charge or for a nominal charge (i.e. hard copy publications distributed free of charge);
- OR**
- Consumption in the production process of goods to be distributed at no charge or for a nominal charge (i.e. ink and paper used in the production of publications).

Current replacement cost is the cost the United Nations would incur to acquire the asset on the reporting date.

6.2.4 Obsolescence

Inventory should be analyzed for **obsolescence** (e.g. old publications, spare parts related to assets that are at the end of their useful lives, etc.) to ensure that they reflect assets with future economic benefits or service potential.

Apart from physically checking for obsolete items during the physical verification, if the items on hand are significantly larger in quantity than those issued out during the period, this may be a sign of an obsolescence issue.

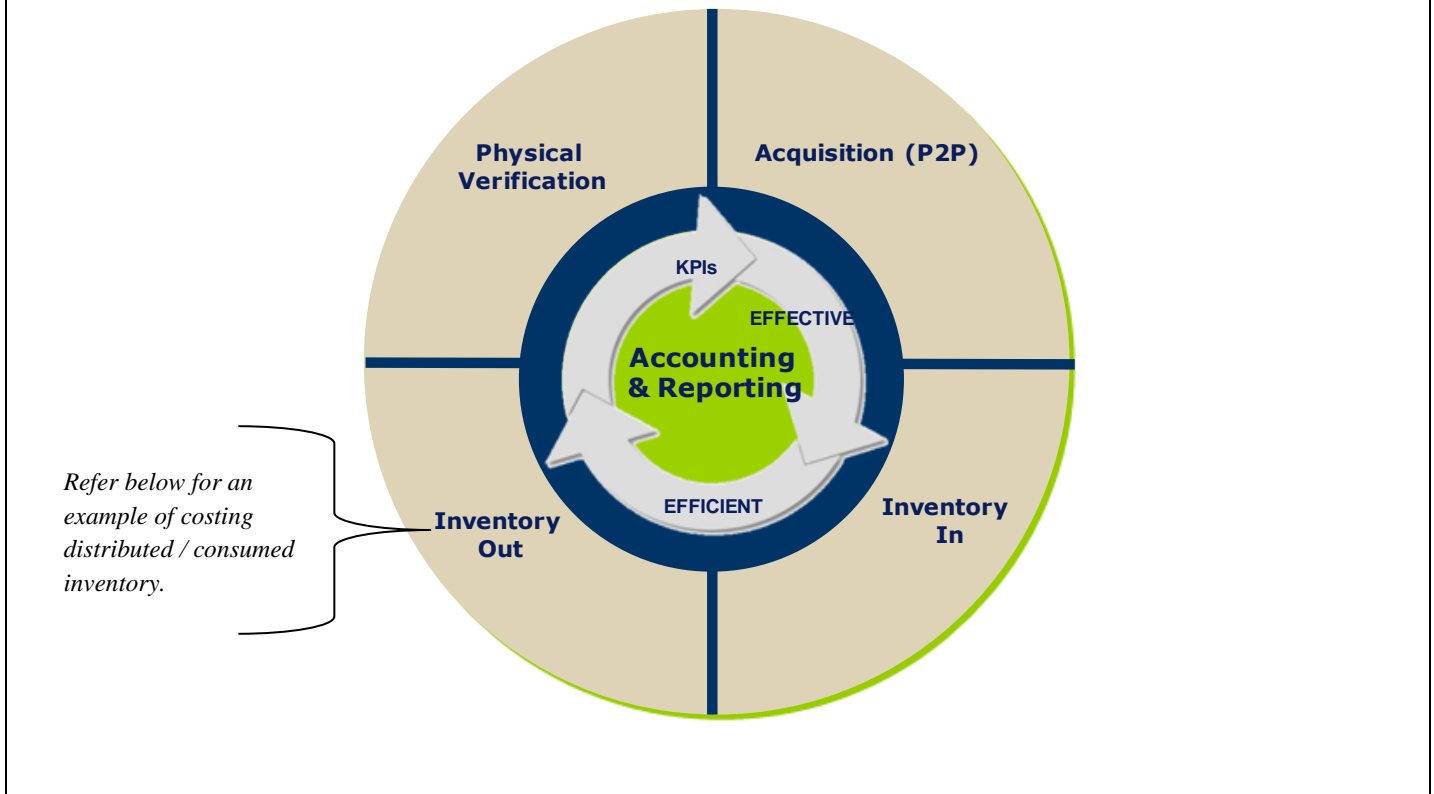
In general, inventory without consumption/ distribution over more than two years should be analyzed in detail to see if obsolete to ensure that they reflect assets with future economic benefits or service potential. However, consideration as to the future economic benefit and service potential should be taken into account, before automatically applying the two year rule.

Once obsolete inventory has been identified, the **total cost** of the obsolete, damaged, or expired inventory should be **written off** as an expense in the statement of financial performance.

6.3 Measurement of inventory consumption / distribution

Refer to the illustration on the following page to see the impact of inventory consumption on the lifecycle of inventory.

Illustration – Inventory lifecycle at consumption (Inventory-Out)



As the Standard stipulates, when inventories are sold, exchanged or distributed the carrying amount of those inventories is recognized as an expense in the period in which the related revenue is recognized. If there is no related revenue (i.e. distribution to other parties for no or nominal charge), the expense is recognized when the goods are distributed.

For non-field missions the cost of consumed / distributed inventory will be determined based on a periodic weighted average price until Umoja go live date. Afterwards, a perpetual moving average method will be used.

For field missions using Galileo, the cost of consumed / distributed inventory is determined using moving average price, which is calculated automatically by the perpetual inventory system.

Refer below for an example of how the cost of inventory under MAP is calculated.

Example – Moving average price “MAP”

Under the moving average inventory method, you re-calculate the average cost of each inventory item after every inventory purchase. The calculation is:

$$= \textit{The total cost of the items purchased / by the number of items in inventory}$$

The cost of ending inventory and the expense are then set at this average cost. Refer below to see the calculation in practice and the measurement related to ration packs using moving average price over the period of one month.

The United Nations has 1,000 ration packs in inventory as of the beginning of April, at a cost per unit of \$5.

5 April

Distributes 250 packs on April 5, and records a charge to expense of \$1,250, which is calculated as 250 units x \$5 per unit. There are now 750 units remaining in inventory, at a cost per unit of \$5 and a total cost of \$3,750.

10 April

Purchases 250 additional ration packs on April 10 for \$6 each (total purchase of \$1,500). The moving average cost is now \$5.25, which is calculated as a total cost of \$5,250 divided by the 1,000 units still on hand.

12 April

The United Nations then distributes 200 packs on April 12, and records a charge to expense of \$1,050, which is calculated as 200 units x \$5.25 per unit. This means there are now 800 units remaining in inventory, at a cost per unit of \$5.25 and a total cost of \$4,200.

20 April

Finally, the United Nations buys an additional 750 ration packs for \$7 each (total purchase of \$5,250). At the end of the month, the moving average cost per unit is \$6.10, which is calculated as total costs of \$4,200 + \$5,250, divided by total remaining units of 800 + 750.

In summary the United Nations begins the month with a \$5,000 beginning balance of ration packs at a cost of \$5 each, distributes 250 packs at a cost of \$5 on April 5, revises its unit cost to \$5.25 after a purchase on April 10, distributes 200 packs at a cost of \$5.25 on April 12, and finally revises its unit cost to \$6.10 after a purchase on April 20.

Note that the cost per unit changes following an inventory purchase, but not after an inventory consumption.

Please refer below for an example of stamps being donated by UNAP.

Example – Inventory consumption (Postage stamps)

The United Nations produces and sells specialty postage stamps. As indicated in IPSAS, organizations responsible only for the publishing should recognize stamps inventory at cost (e.g. artist fees, paper, glue, etc.).

While the stamps are generally sold for market prices, occasionally, the United Nations Postal Administration “UNPA” decides to provide old off-sale (i.e., have been removed from the market as available for sale stamps) complimentary to stamp clubs for promotional purposes.

How should UNAP recognize the following in-kind distribution of stamps in the financial statements? Assume that the UNAP donated in kind stamps have a cost of \$30 (refer to UNAP’s costs analysis of the donated stamps below):

Stock Movement at Production Price					
Quantity	Type	Number	Text	Production Unit Cost	Total
25	813	3781	VI AIDS FDC MINI-SHEET	0.523	13.075
25	615	3747	GE SPACE FLIGHT FDC SOUV SHEET	0.523	13.075
5	351	2792	34 ENDANGERED SPECIES 2002 -FS	0.288	1.44
5	551	2793	FS90 ENDANGERED SPECIES '02-FS	0.288	1.44
5	751	2794	EO,51 ENDANGERED SPECIES'02-FS	0.288	1.44
Total Stock Movement					\$30.47

Journal entry to record distribution in-kind:

Financial statement	Account	Amount
Statement of Financial Performance	Dr Expense in-kind contribution	\$30
Statement of Financial Position	Cr Inventories	\$30

6.4 Measurement of closing balances

At the end of the annual financial period and lifecycle of inventory, a physical verification of inventories should take place for non-field missions that do not have an automated inventory management system in place. For an illustration of a physical verification count exercise, please see workflows in section 9.4.

Controls should be in place to safeguard the accuracy of the count. For example:

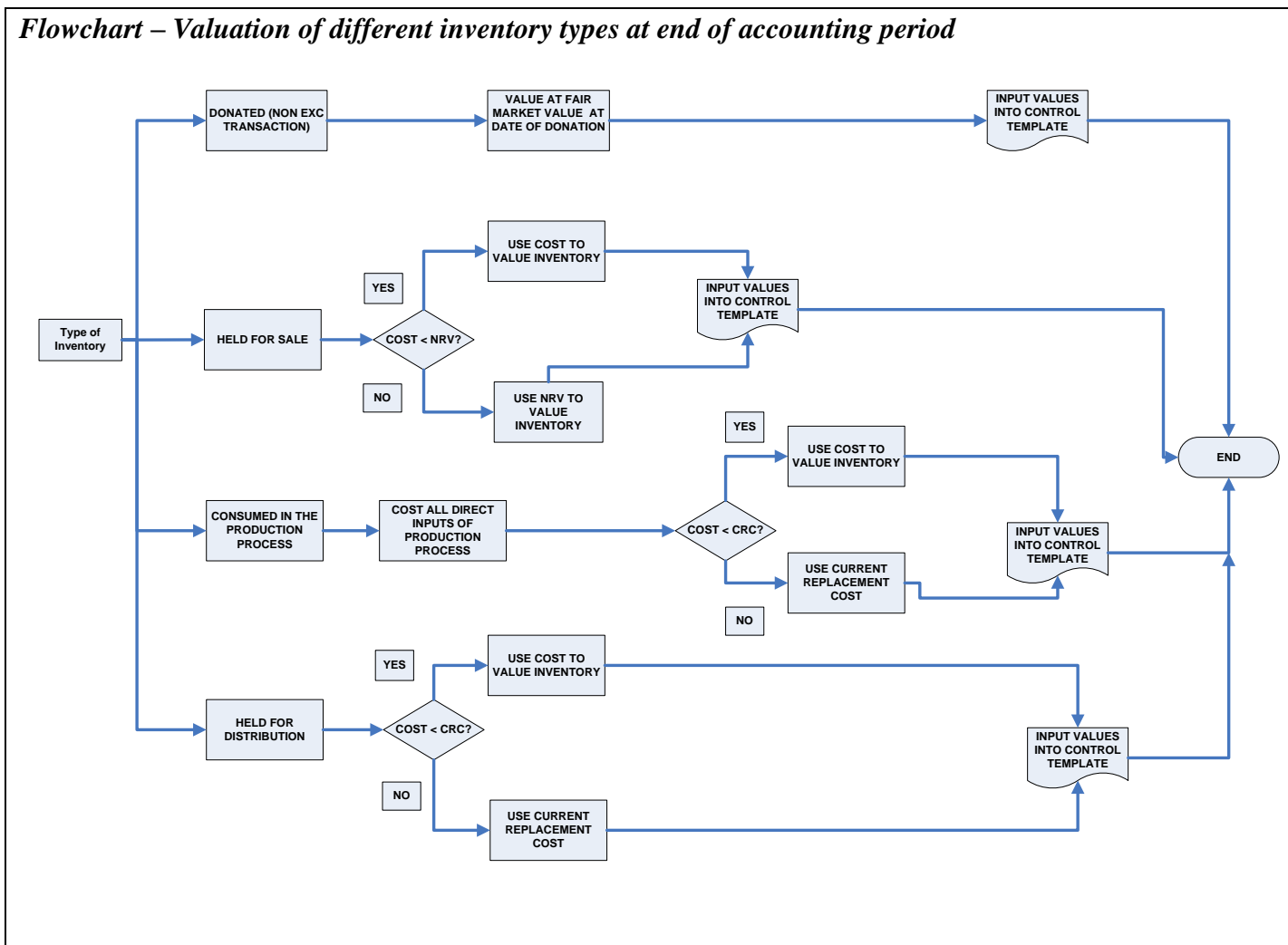
- Segregation of duties between personnel who conduct the count and those who have daily custodian ship;
- The results of the counts should be checked against the stock cards; and
- The physical count and the reconciliation of inventory must be done independently of each other.

The results of the count should be valued based on the type of inventory (i.e. held for sale, donated, obsolete).

For **non-field missions**, the cost compared against NRV, CRC or FV, will be the periodic weighted cost calculated by inventory type for the year. For **field missions** using Galileo, the closing balance will be measured at the moving average price.

Any discrepancies identified during the physical verification count, must be investigated, differences approved and corrective action taken to ensure the physical quantities during the physical verification exercise align with the recorded quantities. Subsequently, stock cards should be updated upon approval for any discrepancies found and signed off on.

Refer to the flowchart below for valuation and measurement of different inventory types at end of accounting period.



7 Other Topics

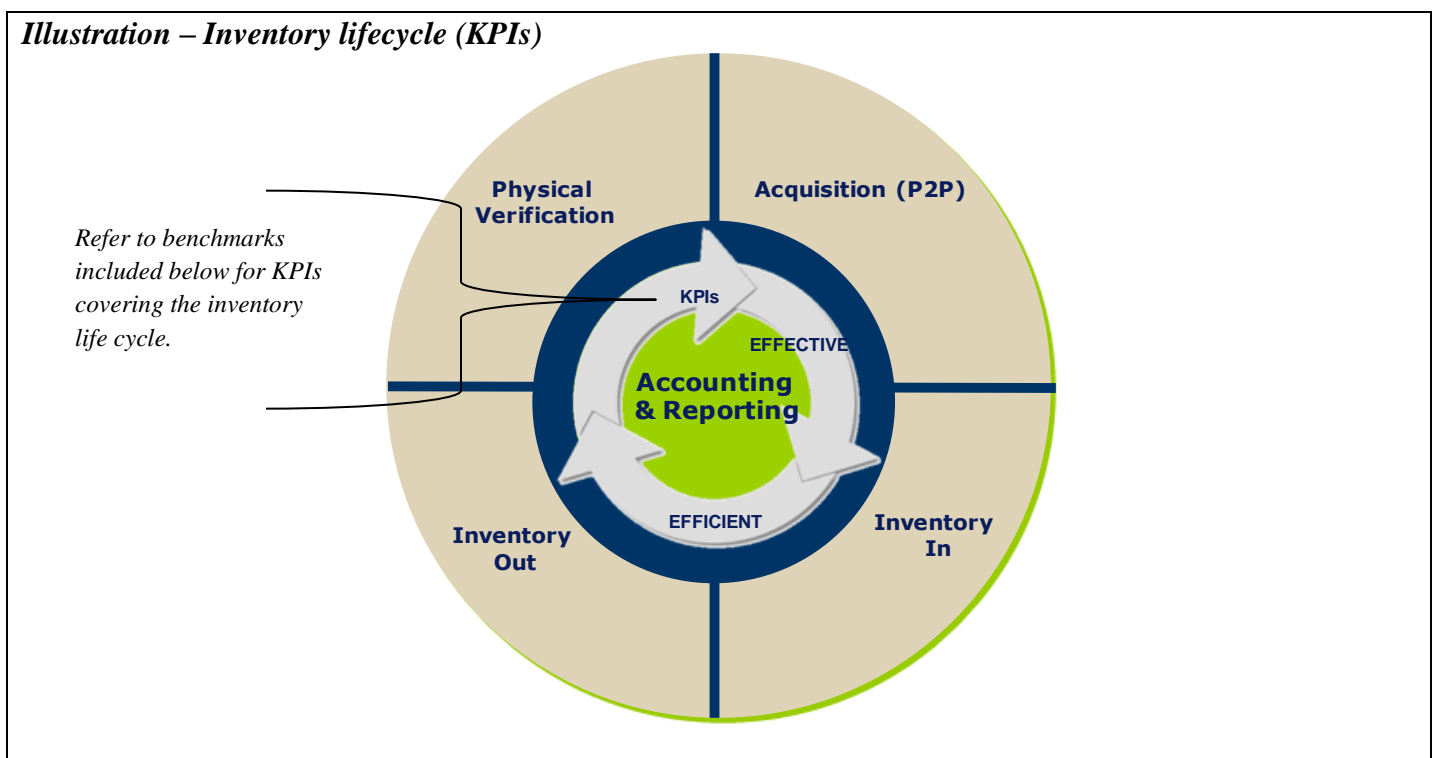
7.1 Key performance indicators (KPIs)

Key performance indicators (KPIs) are used by many organizations to evaluate and improve the efficiency of a particular business process or activity. The following examples of KPIs are representative of standard industry best practices for inventory management. A number of these KPIs are already used by field missions,¹ while others may be more applicable to non-field missions which have inventory held for sale. Some of these KPIs may not be applicable at all given that the procurement and property management functions are managed separately pre-Umoja. These KPIs should be interpreted only as examples of leading practices and not as prescriptive guidance. Such guidance on use of KPIs will be provided by the Property Management Working Group at a later date.

The examples of KPIs listed below are organized in accordance with the inventory life cycle. For each KPI the following information is provided:

- Objective;
- Calculation;
- Benchmark based on industry leading practices²; and
- Application.

Refer to the illustration below for how KPIs interact within the inventory lifecycle.



¹ The information on KPIs used at DFS was received in August 2012 as part of an assessment of UN's Property Management functions and processes summarized in a report "Effective Property Management and IPSAS Compliance".

² PwC: Global Best Practices: Supply Chain Report (2006).

The following KPIs help to promote **efficiency** and **effectiveness** at each stage of the inventory lifecycle (Acquisition, Inventory-In, Inventory-Out, and Physical verification):

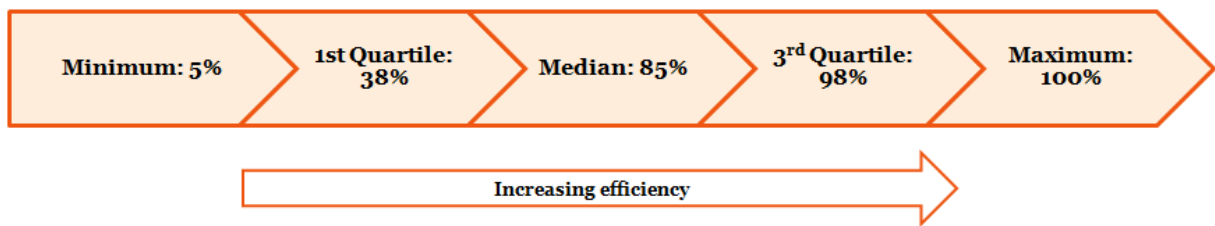
Acquisition

- **Percentage of purchases from certified supplier.**

Objective: This KPI indicates how well the organization selects and manages suppliers such that their products conform to their quality criteria.

Calculation: The metric is calculated as total spend by certified suppliers divided by the total spend.

Benchmark:



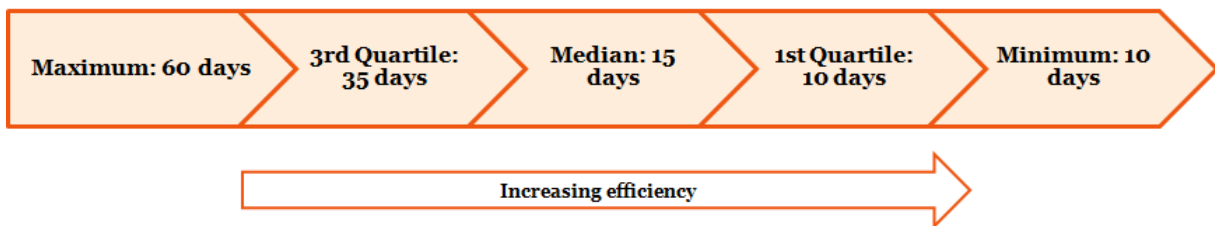
Application: Increasing purchases from certified suppliers implies that purchasing is from reputable sources that meet or exceed performance standards where deliveries tend to have more reliable expected delivery dates, quality issues decrease, and acquisition planning can be more accurate. In addition, there are fewer decentralized purchases through other vendors and promotes consolidated purchasing. Based on information received from DFS in August 2012, this KPI is currently not measured by field missions.

- **Purchase requisition to delivery cycle time.**

Objective: Indicates how quickly the purchaser receives a good. It is a barometer for how adaptable a supply chain can operate.

Calculation: The average number of business days from the creation of a purchase requisition to goods being delivered to the requestor.

Benchmark:



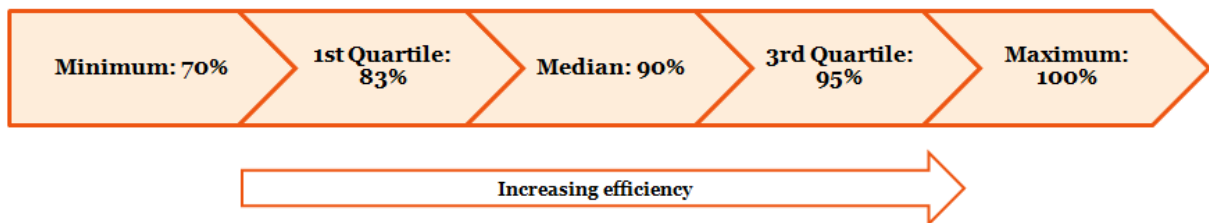
Application: Improved requisition to delivery cycle time improves overall asset lifecycle management that recognizes the asset at time of acquisition. Leading industry practices recommend that communication with suppliers can be improved through electronic data interchange or internet communications. In addition, supplier selection process should include verification of their on-time delivery historical records as well as ongoing delivery performance tracking. Based on information received from DFS in August 2012, this KPI is currently not measured by field missions.

- **Percentage of complete, high-quality, timely, and accurate orders.**

Objective: Measuring the level of service of suppliers.

Calculation: Number of orders received on time, in the correct amount, and the correct item divided by the total number of orders.

Benchmark:



Application: The level of service provided by vendors indicates the number of deliveries received on the planned receipt date, in the quantity ordered, and the quality expected. This metric can be included in vendor performance standards and leveraged contractually to increase or decrease ordering with a vendor based upon the performance. Based on information received from DFS in August 2012, this KPI is currently not measured by field missions.

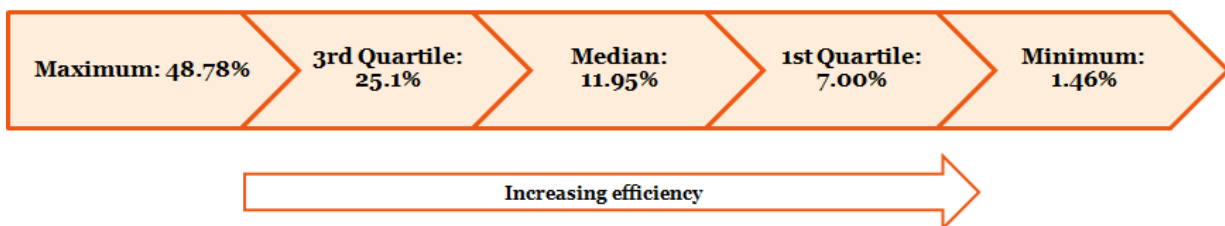
Inventory – In

- **Warehousing and inventory management cost as a percentage of inventory value.**

Objective: This KPI measures holding costs (i.e. how much it costs to store the inventory) compared to the value of the inventory. The result will indicate whether the warehouse may be holding too much inventory or too much inventory of a low value.

Calculation: Total warehousing and inventory management cost divided by the average value of finished goods inventory.

Benchmark:



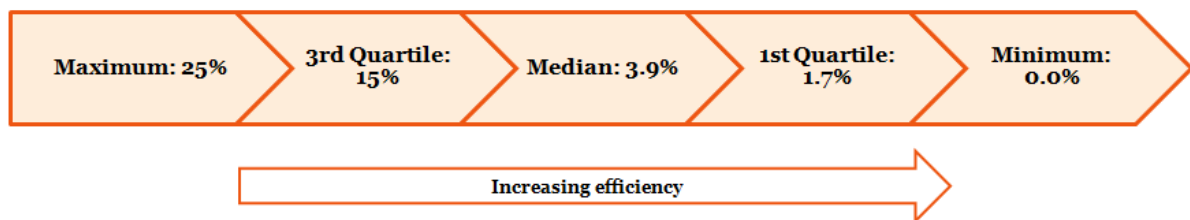
Application: Reducing the warehousing and inventory management cost as a percentage of inventory value indicates decreased carrying costs of holding fewer assets and improved planning and fulfillment accuracy. Based on information received from DFS in August 2012, this KPI is currently not measured by field missions. An example where this could be applied at the United Nations is for items held for sale such as publications and books. Since hard copies of publications can take a significant storage space, it may be useful to measure the storage cost as a percentage of inventory value.

- **Inactive inventory percentage.**

Objective: Calculates percentage of inventory units that have not been used in the last 12 months.

Calculation: Total items not used in past 12 months divided by the total items in stock.

Benchmark:



Application: The industry standard's maximum number of items in inventory for 12 months is 25% of inventory. Decreasing lengths of time items are in inventory indicates order and planning accuracy as well as reduce inventory holding costs and improves warehouse utilization. DFS tracks the following KPIs linked to inactive inventory percentage:

- Ageing inventory: 50%, with a tolerance variance of 5%.
- Passed life expectancy in inventory: 10%, with a tolerance variance of 5%.
- Good surplus: 100%, with a tolerance variance of 10%.
- Operational inventory: 90%, with a tolerance variance of 5%.

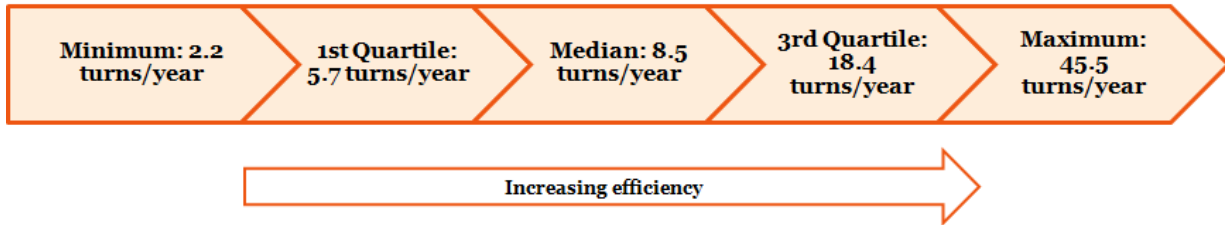
Inventory – Out

- **Total inventory turnover.**

Objective: This KPI measures the number of times inventory is used in a time period such as a year, it reflects inventory planning accuracy and indicates under-stocking and overstocking.

Calculation: Equals cost of goods sold/ issued divided by the average inventory (average inventory equals opening inventory + closing inventory/2).

Benchmark:



Application: Inventory turnover for the lowest performer indicates that inventory should turn at least 2.2 times per year (less than every six months). The turnover for the highest performer according to industry standards is 45.5 times per year. For the United Nations similar KPIs could be established to track how often items held in inventory for use by the organization (vs. for sale) are used. DFS tracks similar KPIs to total inventory turnover, namely: Ageing Stock and Logistics Support Division stock ratio.

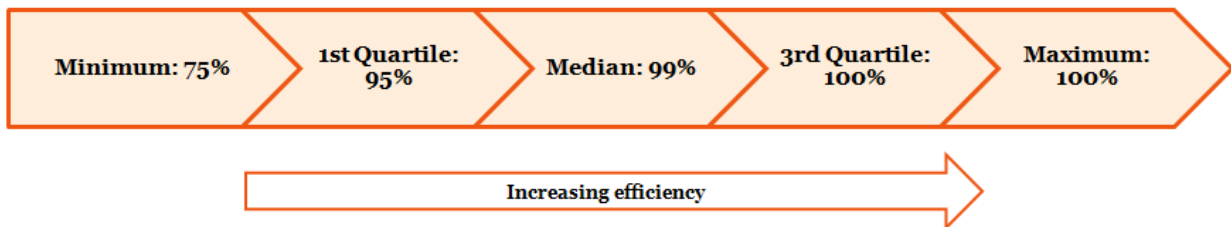
Physical verification

- **Cycle count accuracy percentage.**

Objective: Cycle counting helps organizations identify and correct inventory errors to improve inventory accuracy.

Calculation: Number of items found (matching inventory records) during cycle count divided by the total items to be cycle counted.

Benchmark:



Application: Inventory discrepancy percentage should be no less than 95-99% accurate to meet the average performance. DFS uses a physical accountability KPI, with a target of 100% accuracy. DFS defines average reconciliation process time for physical inventory discrepancies to be 30 days and should be updated systemically at close of accounting month end.

8 Disclosures

The following information outlines required disclosures related to inventory.

As stipulated in IPSAS 12 *Inventories*, the financial statements shall disclose:

- The accounting policies adopted in measuring inventories, including the cost formula used;
- The total carrying amount of inventories and the carrying amount in classifications appropriate to the entity;

- The carrying amount of inventories carried at fair value less costs to sell;
- The amount of inventories recognized as an expense during the period;
- The amount of any write-down of inventories recognized as an expense in the period;
- The amount of any reversal of any write-down that is recognized in the statement of financial performance in the period;
- The circumstances or events that led to the reversal of a write down of inventories; and
- The carrying amount of inventories pledged as security for liabilities.

Example – UNESCO disclosure

NOTE 10: INVENTORIES

Expressed in '000s US dollars	31/12/2010	01/01/2010 Opening Balance (Restated)
Publications	3,300	3,154
Supplies	1,154	1,256
Gross inventories	4,454	4,410
Provision for depreciation of inventories	-	-11
Net inventories	4,454	4,399

Publications include publications held for sale. Full details of publications held to be distributed at no or nominal charge are not currently available, and therefore costs related to these publications are recognized as expenses as they are incurred. Publications for free distribution generally have short useful lives, and therefore the value of any remaining stock at year end would be significantly depreciated. Supplies include principally restaurant supplies and commissary supplies. The provision for depreciation of inventories represents the write down of inventories of publications and supplies to net realizable value.

8.1 Classification disclosure

Information about the carrying amounts held in different classes of inventories and as well as changes in these assets is useful to financial statement users. Common classifications of inventories are merchandise, production supplies, materials, work in progress, and finished goods. The inventories of a service provider (such as the United Nations) may be described as work in progress.

8.2 Expense disclosure

The amount of inventories recognized as an expense during the period consists of those costs previously included in the measurement of inventory that has now been sold, exchanged or distributed, and unallocated production overhead costs and abnormal amounts of production costs of inventories (see section 6 Measurement).

9 Appendices

9.1 Case study – Printshop

FACTS

Facility: An agency of the United Nations operates a printshop facility, producing printed publications for the United Nations.

Inventories: Ink and paper.

Recognition: Inventory should be recognized when the control of the item has passed to the United Nations.

Classification: Given ink and paper are materials stocked exclusively for direct input into the production of publications, they meet the criteria of financial inventory, and should only be expensed upon usage.

It should be noted that the publications are distributed for free.

1 January XX

The printshop acquires the follow inventory from a local supplier:

- Printing paper (MATT 150gsm x 500 pkts); (Cost including delivery and other associated cost is \$65 per packet).

Journal entry to record acquisition of inventory:

<u>Financial statement</u>	<u>Account</u>	<u>Amount</u>
Statement of Financial Position	Dr Inventories	\$32,500 [\$65 x 500 packets]
Statement of Financial Position	Cr Cash / AP	\$32,500 [\$65 x 500 packets]

30 August XX

The printshop uses 300 packets for a major publication for one of its United Nations clients.

Journal entry to record use of inventory:

<u>Financial statement</u>	<u>Account</u>	<u>Amount</u>
Statement of Financial Performance	Dr Expense - Consumption of materials and supplies	\$ 19,500 [\$65 x 300 packets]
Statement of Financial Position	Cr Inventories	\$ 19,500 [\$65 x 300 packets]

1 December XX

A large storm causes flooding in the main storeroom and it is determined 20 packets are damaged beyond use.

Journal entry to record damaged inventory, which are recorded at cost:

<u>Financial statement</u>	<u>Account</u>	<u>Amount</u>
Statement of Financial Performance	Dr Write-off on inventories	\$1,300 [\$65 x 20 destroyed packets]
Statement of Financial Position	Cr Inventories	\$1,300 [\$65 x 20 destroyed packets]

31 December XX

The catalogue cost of the item has fallen to \$50 per packet, including delivery and associated costs.

- Remaining number of packets = 180 [500 (acquired amount) - (300 used in production) - (20 destroyed by flood)].
- Items distributed at no or nominal charge require item to be: recorded at lower cost or current replacement cost:

- Cost = \$11,700 [\$65*180]
- Current replacement cost = \$ 9,000 [\$50*180]

Journal entry to record reduction in value of remaining inventory:

Financial statement	Account	Amount
Statement of Financial Performance	Dr Write-down on inventories	\$ 2,700 [\$11,700 - \$9,000]
Statement of Financial Position	Cr Inventories	\$ 2,700 [\$11,700 - \$9,000]

31 December XX

Value of remaining inventory on the statement of financial position at 31 December.

Inventory at 31 December	
1-Jan Acquired inventory at cost	32,500
30-Aug Inventory used in production	(19,500)
1-Dec Damaged inventory	(1,300)
31-Dec Write down to replacement cost	(2,700)
31-Dec Inventory included in the statement of financial position	9,000

Disclosures

Required financial disclosure required at the end of the period.

Disclosure at 31 December	
Carrying amount of inventories	9,000
Inventories expensed during period	19,500
Inventories written down as expense during period	4,000

9.2 *Case Study – Purchased publications*

FACTS

Agency: UN Habitat.

Publication: Report on Human Settlements.

Frequency: Published every 2 years.

The publication is printed under a co-publishing agreement. UN Habitat purchased 3,500 copies at a 60% discount of the sales price, for a total cost of \$69,930. They also received 500 additional copies for free as an additional discount to the purchase price. The total cost included printing and delivery to UN Habitat's official distributor in London. The selling price amounts to \$58.00.

Publication: Report on Human Settlement	
Quantity	4,000 [3,500+500]
Unit production cost	\$17.48 [\$69,930 / 4,000]
Selling price	\$58.00

As the publication is re-printed every 2 years, we can assume that people may wait to purchase the study in the second year in anticipation of updated data being released. This is important to note for the assessment of obsolescence.

Consider for 31 December, Year 2 and Year 3, the NRVs of the publication are \$29 and \$14.50, respectively.

The inventory movements are as follows:

		Quantities
1 January Year 1	Buy	4000
1 March Year 1	Sell	-174
1 June Year 1	Distribution for free	-2835
31 December Year 1	Ending inventory	991
	Sell	-506
31 December Year 2	Ending inventory	485
	Sell	-285
31 December Year 3	Ending inventory	200
	Sell	-100
31 December Year 4	Ending inventory	100

1 January, Year 1

Purchase 4,000 [3,500+500] copies of publication for \$69,930.

Journal entry to record purchase of publication:

Financial statement	Account	Amount
Statement of Financial Position	Dr Inventories	\$ 69,930 [\$17.48 x 4,000 reports]
Statement of Financial Position	Cr Cash / AP	\$ 69,930 [\$17.48 x 4,000 reports]

1 March, Year 1

UN Habitat sells 174 copies of the report for \$58 each.

Journal entry to record sale:

Financial statement	Account	Amount
Statement of Financial Position	Dr Cash / AR	\$ 10,092 [\$58 x 174 reports]
Statement of Financial Performance	Dr Cost of Goods Sold	\$ 3,042 [\$17.48x 174 reports]
Statement of Financial Position	Cr Inventories	\$ 3,042 [\$17.48x 174 reports]
Statement of Financial Performance	Cr Revenue	\$ 10,092 [\$58 x 174 reports]

1 June, Year 1

2,835 copies are distributed for free to partners, offices, perm reps, UNICs and depository libraries.

Journal entry to record in-kind distribution:

Financial statement	Account	Amount
Statement of Financial Performance	Dr Expense in-kind contribution	\$ 49,556 [\$17.48 x 2835 reports]
Statement of Financial Position	Cr Inventories	\$ 49,556 [\$17.48 x 2835 reports]

31 December, Year 1

- Ending inventory: 991 [4,000 – 174 – 2,835].
- Test for write-down: As noted, the publication is re-printed every 2 years. Considering this, the publications should not be written down/off yet.

31 December, Year 2

- Ending inventory: 485 [991 – 506 (amount of publications sold during year 2)]
- Test for write-down: considering an updated publication will be released in the coming months, the market value of the remaining 485 reports would be expected to decline.
- IPSAS 12 requires inventories held for sale to be held as the **lower** of their cost of NRV. Considering the NRV of these publications, \$29, is still greater than their cost of \$17.48 cost, no write-down should be recorded.

31 December, Year 3

- Ending inventory: 200 [485 – 285 (amount of publications sold during year 3)]
- Test for write-down: considering an updated publication was released in the prior year, the market value of the remaining 200 reports would be expected to decline.
- IPSAS 12 requires inventories held for sale to be held as the **lower** of their cost of NRV. Given the NRV of these publications, \$14.50, is less than their cost of \$17.48, a write-down should be recorded.

Journal entry to record impairment:

Financial statement	Account	Amount
Statement of Financial Performance	Dr Write-down on inventories	\$ 596 [\$3,496 - \$2,900]
Statement of Financial Position	Cr Inventories	\$ 596 [\$3,496 - \$2,900]

31 December, Year 4

- Ending inventory: 100 [200 – 100 (amount of publications sold during year 4)]
- Test for write-down: considering an updated version has been released for 2 years, and a new version coming in the next few months, the remaining value of the publication is considered zero.
- Identified as obsolete, **write-off** remaining inventory.

Journal entry to record write-off for obsolete inventory:

Financial statement	Account	Amount
Statement of Financial Performance	Dr Write-off on inventories	\$ 1,450 [\$14.50 x 100]
Statement of Financial Position	Cr Inventories	\$ 1,450 [\$14.50 x 100]

Disclosures**31 December, Year 1**

Carrying amount of inventories	17,332
Inventories expensed during period	52,598

31 December, Year 2

Carrying amount of inventories	8,482
Inventories expensed during period	8,850

31 December, Year 3

Carrying amount of inventories	2,900
Inventories expensed during period	4,986
Inventories written down as expense during period	596

31 December, Year 4

Carrying amount of inventories	-
Inventories expensed during period	1,450
Inventories written off as obsolete during period	1,450

9.3 Case Study – ITC

FACTS

Agency: International Trade Center (ITC)

Publication: Informational study

Co-published: Costs related to inventory are shared jointly between ITC and a third party organization.

A further analysis of the co-publishing arrangement should be performed. The following is indicated in the agreement as of 1 January, Year 1:

- Financing is shared jointly, or 50/50 between ITC and the third party:

Cost incurred to produce joint publication:	
Quantity produced	500
Cost of publication (unit)	\$ 40
Total publication costs	\$20,000
<i>Total costs paid by ITC</i>	<i>\$10,000</i>
<i>Total costs paid by third party</i>	<i>\$10,000</i>

- ITC bears the cost of insuring the entire amount of inventory.

Given that ITC bears the costs to insure the entire amount of inventory, ITC is deemed to have **control** of the inventory. Therefore, 100% of the inventories belong to ITC and should be recognised regardless of who financed it.

For 31, December, Year 1, assume the following scenarios and details:

- 100% of the publications are held for sale (sales price is \$60) (300 units of the 500 produced units are sold); OR
- 70% of the publications are held for sale (sales price is \$60) (250 units of the 350 produced units are sold) and 30% are donated (50 units of the 150 produced units are donated in-kind).
- NRV at end of year is \$30. Replacement cost is \$25.

1 January, Year 1

Record 500 publications in inventory at a cost of \$40 / unit.

Journal entry to record inventory:

Financial statement	Account	Amount
Statement of Financial Position	Dr Inventories	\$20,000 [\$40 x 500 publications]
Statement of Financial Performance	Cr Revenue in-kind contribution	\$10,000
Statement of Financial Position	Cr Cash / AP	\$10,000

31 December, Year 1

Assume the following scenarios:

- 100% of the publications are held for sale (sales price is \$60); OR
- 70% of the publications are held for sale (sales price is \$60) and 30% are donated.
- NRV at end of year is \$30. Replacement cost is \$25.

100% of the publications are held for sale

- 300 units sold during the year for \$60, 200 remaining at 31 December.

Journal entry to record the sales and cost of sales:

Financial statement	Account	Amount
Statement of Financial Position	Dr Cash / AR	\$18,000 [\$60 x 300 publications]
Statement of Financial Performance	Dr Cost of Goods Sold	\$ 12,000 [\$40 x 300 publications]
Statement of Financial Position	Cr Inventories	\$ 12,000 [\$40 x 300 publications]
Statement of Financial Performance	Cr Revenue	\$ 18,000 [\$60 x 300 publications]

- Held for sale, account for ending inventory at lower of cost (\$40) or **NRV (\$30)**.

Journal entry to record write-down to NRV:

Financial statement	Account	Amount
Statement of Financial Performance	Dr Write-down on inventories	\$2,000 [\$10 x 200 publications]
Statement of Financial Position	Cr Inventories	\$2,000 [\$10 x 200 publications]

Inventory balance 31 December:

1-Jan Publication at cost (500 units)	20,000
300 units sold (cost of sales \$40 per unit)	(12,000)
31-Dec Write-down to NRV	(2,000)
Inventory included in statement of financial position (200 units)	6,000

70% held for sale and 30% donated

- Of the 350 units [500 x 70%] designated as available for sale, 100 remain in inventory at 31 December.
 - Held for sale, account for ending inventory at lower of cost (\$40) or **NRV (\$30)**.
- Of the 150 units [500 x 30%] designated as donated in-kind, 100 remain in inventory at 31 December.
 - Donated, account for ending inventory at lower of cost (\$40) or **replacement cost (\$25)**.

Journal entry to record the sales/ distribution for free and cost of sales:

Financial statement	Account	Amount
Statement of Financial Position	Dr Cash / AR	\$15,000 [\$60 x 250 publications]
Statement of Financial Performance	Dr Cost of Goods Sold	\$ 12,000 [\$40 x 300 publications]
Statement of Financial Position	Cr Inventories	\$ 12,000 [\$40 x 300 publications]
Statement of Financial Performance	Cr Revenue	\$ 15,000 [\$60 x 250 publications]

Journal entry to record write-down of inventory to NRV and replacement cost:

Financial statement	Account	Amount
Statement of Financial Performance	Dr Write-down on inventories	\$2,500 [\$10 x 100 publications] [\$15 x 100 publications]
Statement of Financial Position	Cr Inventories	\$2,500 [\$10 x 100 publications] [\$15 x 100 publications]

Inventory balance 31 December:

1-Jan Publication at cost (500 units)	20,000
250 units sold (cost of sales \$40 per unit)	(10,000)
50 units donated (cost of sales \$40 per unit)	(2,000)
31-Dec Write-down to NRV	(1,000)
31-Dec Write-down to current replacement cost	(1,500)
Inventory included in statement of financial position (200 units)	5,500
Equals:	
Available for sale: 100 x \$30	3,000
For free distribution: 100 x \$25	2,500

Disclosures

100% of the publications are held for sale

	31-Dec
Carrying amount of inventories	6,000
Inventories expensed during period	12,000
Inventories written down as expense during period	2,000

70% held for sale and 30% donated

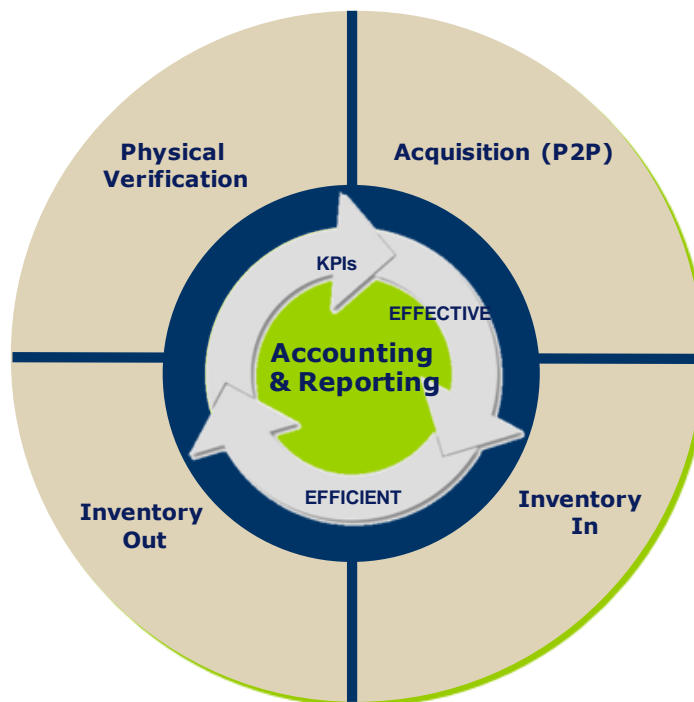
	31-Dec
Carrying amount of inventories	5,500
Inventories expensed during period	12,000
Inventories written down as expense during period	2,500

9.4 Workflows

9.4.1 Inventory process

Refer below for leading practices workflows related to the lifecycle of inventory, including: acquisition, delivery, ultimate issuance, and verification.

Illustration – Best practice workflows during the inventory lifecycle (Acquisition, Inventory-In, Inventory-Out, and Physical verification)



Acquisition

In order to acquire inventories, purchase requisitions and purchase orders must be used in compliance with procurement rules and the correct approvals obtained.

The requisitioner needs to ensure that the purchasing objective is known at the requisition stage to ensure the correct classification of inventories is made. This will be reflected in the choice of the material type, as this will have an impact on the future accounting treatment and entries. This applies both post and pre Umoja implementation. The acquisition process must adhere to the delivery principle and inventory should be recognized based upon Incoterms. We refer to Corporate Guidance #2 *The delivery principle* for a detailed discussion.

Inventory – In

When inventory is delivered to a central location or warehouse, the receiving personnel must conduct an inventory inspection as follows:

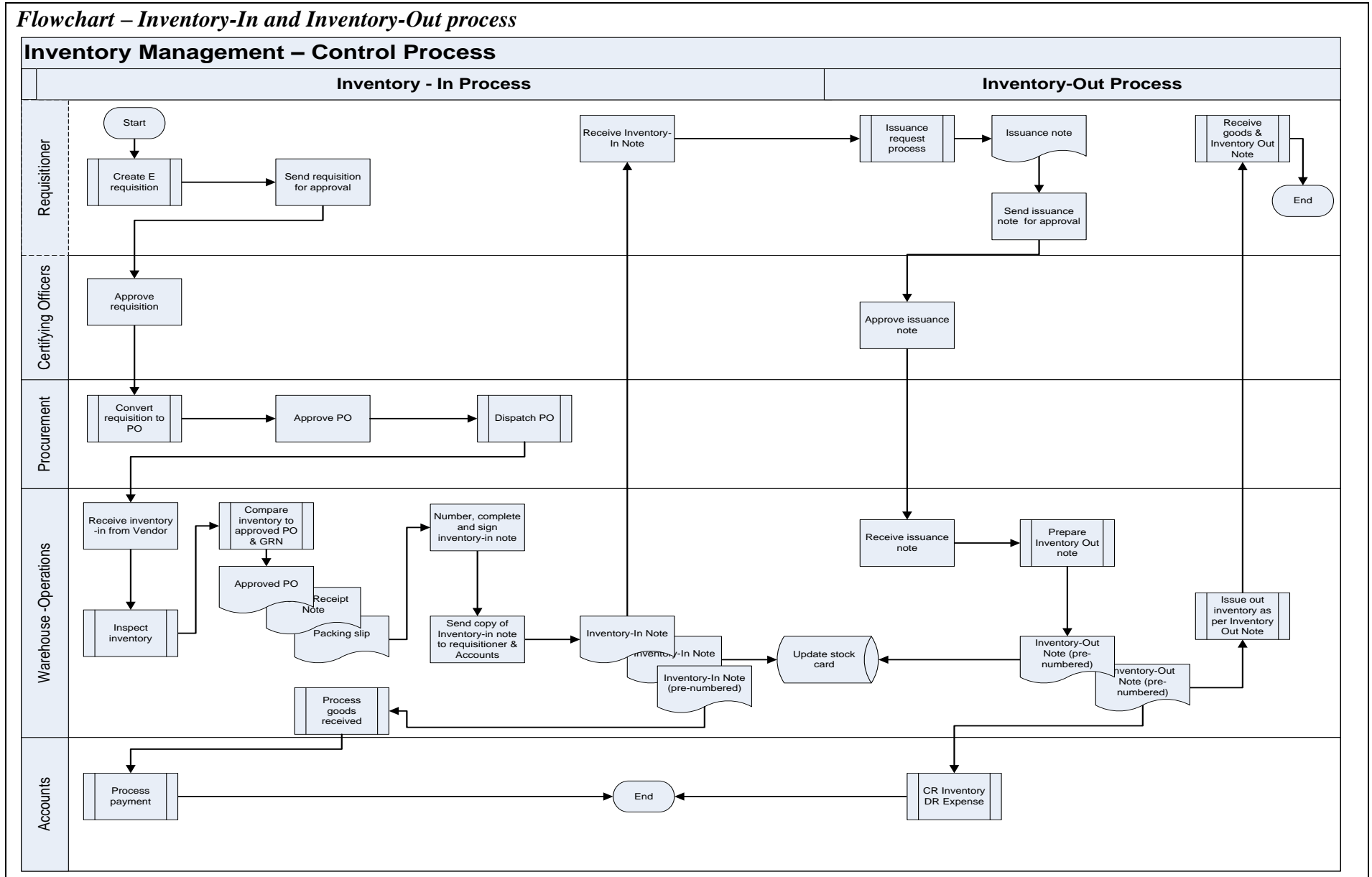
- Compare inventory shipment to the packing slip, purchase order and goods receipt note (GRN);
- Reject any unauthorized or damaged inventories at the point of receipt;
- Record the inventories and quantities received, a description of the items, the PO number and date of delivery in an inventory-in note. This must be signed by the receiving personnel;
- Send copies of the inventory-in note and the GRN to the finance team for processing of payment and to the requisitioner/buyer to track orders delivered;
- Assign a sequential number to the inventory-in note for future reference;
- Update the stock card with the inventory-in note and file;
- Maintain stock records - required for audits and aids the physical verification exercise; and
- For field missions, Galileo must be updated to reflect inventory received into stock.

Inventory – Out

When inventories are issued out of a central location or warehouse, the following procedures must be followed:

- An issuance note must be completed by the requisitioner and approved by a designated authorized personnel;
- The issuance note must be assigned a sequential number;
- Inventories ready to be issued out or distributed must be separated from the rest of the inventories;
- From the issuance form, the inventory-out note must be completed with the date of distribution , details of the inventory and quantity to be distributed and reference to the issuance form i.e. use the sequential number ;
- The inventory-out note must be assigned a sequential number, signed by the receiving party and a copy kept for future reference;
- The stock card must be updated from the inventory-out note;
- Maintain stock records - required for audits and aids the physical verification exercise; and
- For field missions, Galileo must be updated to reflect inventory issued out.

Refer below for a flowchart illustrating the inventory-in and inventory-out process.



Physical verification

IPSAS 12 requires inventory held at the end of a reporting period to be measured, accounted for and recognized as a current asset in the statement of financial position. Therefore, **physical verification** is required to help to account for inventories.

Financial and **non-financial** inventories should be stored separately, where possible, to aid the physical verification exercise.

Year-end physical inspections are important as cycle counts during the year will not give enough assurance at this stage. Refer below for the planning.

Planning

Define roles and responsibilities:

- Segregation of duties must be maintained throughout the process;
- A focal point must be appointed to oversee the physical verification exercise. Appoint individuals who are independent of the daily custodianship of inventory; and
- The physical count and reconciliation of inventory must be done independently of each other.

Establish a master schedule:

- This should establish clear guidelines and set out the timeline for the physical count and the reconciliation of the inventory items;
- Ideally, the count should be performed as close as possible to a period end.
- All transaction activities such as the receiving and distribution of inventories, should be suspended during this time to make the count more efficient;
- For exceptional mandatory transactions, where suspension of inventory transactions is not feasible, back up documentation should be maintained and the quantity reflected in the count or subsequent discrepancy reconciliation. A count tag should be attached to the documentation;
- Items to be included and excluded from the count should be identified before the count commences; and
- All members of the count team should be informed of the entire end to end count exercise.

Notify affected stakeholders: Vendors, customers and staff should be notified in advance of the suspension of receiving and issuing inventories, so they can plan ahead and make alternative arrangements where necessary.

Purchase necessary supplies: Adequate supplies of stationery to be used for the count should be purchased in advance such as sequentially numbered inventory tags, gloves or masks if handling special materials, scales, tape, markers, pens, step tools etc.

Prepare the storage area:

- Organize storage area in preparation of physical count:
 - Update the storage area floor plans to reflect current inventory locations and identify count areas;
 - Arrange items so they can be easily counted;
 - Segregate financial inventory from non-financial inventory; and
 - Group like items together.

- Organize the inventory items:
 - Arrange items by expiry date to facilitate the count;
 - For medical items, the storage instructions issued by WHO must be complied with where applicable;
 - Mark package quantities if necessary;
 - Count and seal partial packages with the count and date marked clearly;
 - Cross out previous count results and any other conflicting information;
 - Separate items that should not be included in the count such as ready to be issued or distributed items and mark “INVENTORY-OUT: DO NOT COUNT”. Ensure that the stock cards have been updated to reflect this;
 - Identify damaged goods and move them to a designated area;
 - Label storage areas to be counted. For example, label shelving units alpha numerically (AB1, CD2) and label individual shelves numerically (top shelf AB1-1, second shelf AB1-2 ETC). This will make it easier keep track of areas that have been counted;
 - Ensure all items are identified by a barcode, item number or some other form of identification; and
 - All inventory in transit in which the title has already passed to the United Nations should be counted and included in the statement of financial position provided they are financial inventory.

- Organize the counting teams:
 - Establish a count team with an individual to lead and supervise the process. The number of team members will be dependent on the size of the warehouse location;
 - Appoint individuals who are independent of the daily custodianship of inventory;
 - Ensure segregation of duties is adhered to especially between the counting and the reconciliation processes; and
 - Appoint someone to supervise the count and ensure at least 2 persons per count team.

Develop written instructions for the count: Ensure that each member of the team has a copy of the instructions and an overview of the entire end to end process is given to ensure clarity of roles and expectations. See sample instructions in the attached Annex.

Physical Count

Conducting the physical count:

- Review the counting instructions with the team before the count commences;
- Give an overview of the count and explain the complete process and why the exercise is being conducted;
- Demonstrate an example of an actual count;
- Control the inventory tags or count sheets and the log;
- When issuing inventory tags to the team, ensure each stack issued out is complete and in numerical sequential order. Keep a log to help identify any discrepancies in tags returned;
- Complete inventory tags in ink and ensure errors are corrected clearly. If a new tag needs to be used due to an error, the old tag must not be discarded but marked “error - do not count”;
- Count items twice: Each count team should be assigned to a specific area for their first count, then perform a second count in another area to confirm the area’s first count;
- Discrepancies should be immediately brought to the attention of the supervisor leading the count; and
- A third, fourth or even fifth count may be necessary to obtain any accurate count or to investigate the differences.

Physical verification requires at least two counts be completed to ensure accuracy of information submitted, please refer to an example below of inventory counts and the information collected and verified during both.

Example – Physical verification counts

There will be two counts. Instructions for each count are different and are provided below:

Count #1: Teams are comprised of two members. Each team is provided with inventory tags to complete the following:

- One person counts the items;
- The second person records the count and item information on the inventory tag; and
- The tag will be taped to the shelf where the item is located.

For accuracy, team members should switch roles occasionally in order to stay sharp and focus on the count.

Sample inventory tag:

TAG NO. 0001	ARTICLE OR KIND OF MATERIAL	ARTICLE OR KIND OF MATERIAL			TAG NO.
		A			0001
INVENTORY	ARTICLE OR KIND OF MATERIAL	UNIT	COUNTED BY		UNIT
		J	D		D
AMOUNT	AMOUNT	AMOUNT	SIZE	COUNTED BY	AMOUNT
		E	F	C	C
G	G	LOCATION		PACKED BY	CHECKED BY
		BLDG.	SEC.	FLOOR	J
H	H	REMARKS			TOTAL VALUE
					DATE
Unit means Singles, Pairs, Pcs., Lbs., Ft., Yds., Gals., Reams, Etc. Enter only one item on tab. All tags must be accounted for.					If notations are made on back mark X here _____

You are responsible and accountable for all tags assigned to you during the first count. Please use them in order and return any unused tags to the issuing staff member.

The following will need to be indicated on the bottom half of the inventory tags. Refer to the Sample Inventory Tag for correct replacement of each entry:

- Description of item (Product name);
- Item# (or Barcode# or Manufacturer catalogue#);
- Quantity counted;
- Unit of measure – Note: count items according to the units by which they are issued (e.g. tablet or piece), not by the carton or box;
- Location (listed on shelf, e.g., AB1, AB2); and
- Team number.

If the team is unsure of any of the needed information for the tags, please see a supervising staff member (or the focal person for physical counting appointed by RR).

Once your team has completed the first count for the shelves or area which you have been assigned please see a supervisor for assignment to a second count area.

Count #2: After all first counts of inventory items have been completed, your team will be assigned to a different location to verify its first count. Teams will count items and compare it to the first count made. Once it has been verified, the team will complete the top portion of the tag with the following:

- Description of item;
- Quantity counted;
- Unit of measure; and
- Team number (on both sections of the tag).

Your team will tear off the bottom portion of the tag and submit them in numerical order to the supervisor for data entry after you complete your second count. If your team finds **ANY** discrepancies during your second count please notify a supervisor immediately.

Reporting and Accounting

Reconciling Physical Inventory Items: The results of the physical verification exercise must be compared to the inventory card records i.e. inventory in, inventory out and stock cards, and any differences identified, explained and corrected.

Inventory Control Template:

- Input the results of the physical count into the inventory control template;
- Input the balances from the inventory cards, e.g. stock cards, issuance notes, inventory in and out note, into the inventory control template;
- Include quantities for inventory in transit in the report;
- Damaged or expired inventory found during the count will need to be disposed of and the corresponding information reflected in the inventory control template;
- The differences between the physical count quantities and the inventory cards must be investigated;
- Once the difference has been investigated, the explanation of the variances must be documented and signed;
- Written approval must be received from the head of the office to update the inventory cards to reflect the; and
- Investigate difference and bring it in line with the physical verification quantities.

Measurement of inventory: After the physical verification count, measurement must be performed by the Offices and included in the inventory control template as follows:

- Inventories held for sale will be measured at the lower of cost and net realizable value;
- Inventories held for distribution at no charge or nominal charge will be measured at the lower of cost and current replacement cost;
- Donated inventories will measured at the fair value at the date of donation;

- Expired, damaged or obsolete stock must be assessed and written-off once obsolescence is determined; and
- The cost of inventories must include the purchase cost, the cost of conversion and all other costs incurred in bringing the inventories to their present condition and locations. All costs incurred are:
 - Purchase price;
 - Import duties and other taxes;
 - Transport costs;
 - Handling costs;
 - Other directly attributable costs.

Inventory Certification: Once the quantities and values of inventory have been determined and input into the inventory control template, this must be signed by the head of office to certify that the physical verification exercise and subsequent valuation of the quantities is in accordance to the guidance provided.

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