

# FROM RAW DATA TO INSIGHTFUL ANALYSES

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The **United Nations Development Programme (UNDP)** is the UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life.

UNDP is on the ground in some 170 countries and territories, supporting their own solutions to development challenges and developing national and local capacities that will help them achieve human development and the **Sustainable Development Goals**.



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# Office of Audit and Investigations

- 85 Staff for audit and investigations: 51 internal audit, 27 investigations, 7 management and support
- HQs audit section in NYC
- Investigations section in NYC
- 5 regional audit centres: Kuala Lumpur, Istanbul, Pretoria, Dakar and Panama (5-7 auditors per centre)



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# UNDP Data 2017

## UNDP

- Working in 170 countries
- Expenditure 6.2 bn USD

## Office of Audit and Investigations

Audits	#	Expenditure (bn USD)
All	126	3.1
Country Office	35	2.3
Projects (outsourced)	59	0.5
Other	30	0.3



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# DEVELOPMENT PROCESS



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# WHY

## Reason

- Identified the need for a more comprehensive / efficient / structured review of available data

## Use

- Annual risk assessment: risk ranking of Country Offices
- Audit risk assessment: show potential areas of non-compliance and operational weaknesses, for further review during the audit.
- Audit: consolidated data extraction





# HOW – FIRST STAGE

- Define Controls / Tests (Procure to Pay – PO / Voucher)
- Develop UNDP ERP (PeopleSoft) queries
- Develop formulas for defined controls
- Test concept (Excel)
- Automate Process (Excel / Visual Basic scripts)
- Visualization (Power BI)







## HOW – SECOND STAGE

- Automate analysis process further
  - Nearly done – controls scripted in SQL
- Add additional data sets
  - HR data / Travel data
- Add controls based on fuzzy logic
  - E.g. check vendor data against vendor sanction list
- Improve overall risk scoring
  - Country Office risk scoring





# RESULT

- Data analytics process and dashboard having 30 controls within 4 categories
  - **Compliance:** focus on issues where the office has deviated from applicable policies (e.g. where a PO was entered and approved by the same person)
  - **Red flag:** related controls focus on issues that could indicate fraudulent behavior (e.g. creation of a related requisition, PO and voucher on the same day)
  - **Timeliness:** focus on issues that could indicate a less than efficient workflow in the office (e.g. a long period between PO creation and approval)
  - **Effectiveness:** focus on issues that could indicate a sub-optimal use of office resources (e.g. requisitions or PO's that have been created, but have not been used)
- Dashboard has drill down option and provides users with option to extract data
- Dashboard can be accessed online by all auditors





# BENEFITS

- Frontloading for stronger assurance
- Ability to analyze large volume of data in an efficient manner
- Analyze all data instead of working with samples
- Focus on high risk areas, adding value to audit process
- Identification of cross cutting issues
- Streamlining of audit processes
- Simplified risk rating process





# CHALLENGES

- Quality of data
- Understanding of data / business processes
- Access to data
- Buy-in of users
- Use of external consultants







# FUTURE



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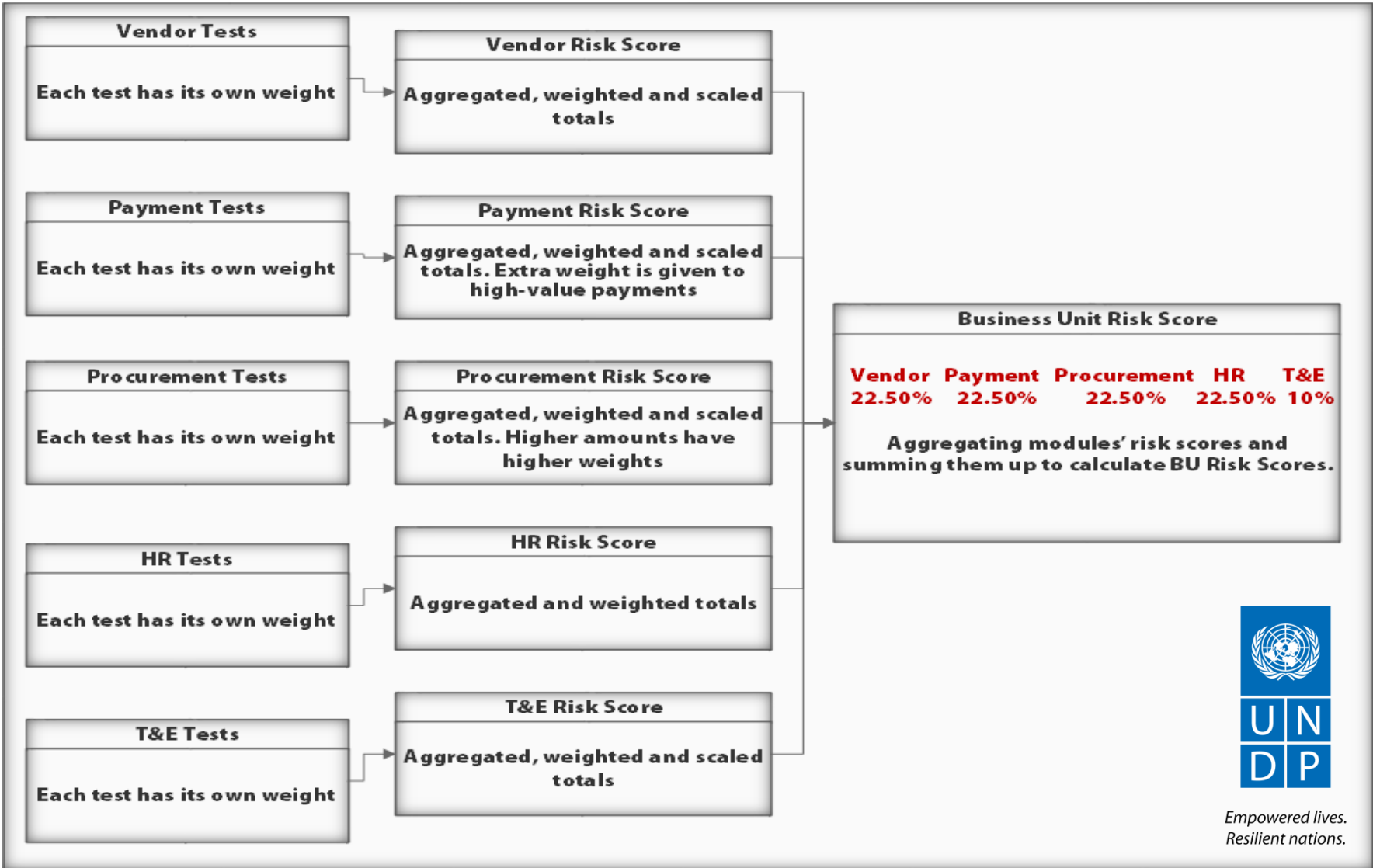
# Future

- Automate ETL
  - Work in progress – direct link between Data Warehouse and SQL server
- Increase refresh
  - Currently quarterly > Future monthly / weekly
- Add controls / Improve existing controls
  - Some additional controls identified – need to be scripted
- Incorporate more data / Add dashboards
- Add data sources (World Bank, etc.)
- Improve Result Quality / Expand Machine Learning (supervised learning)





# Risk Model



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# VISUALIZATION



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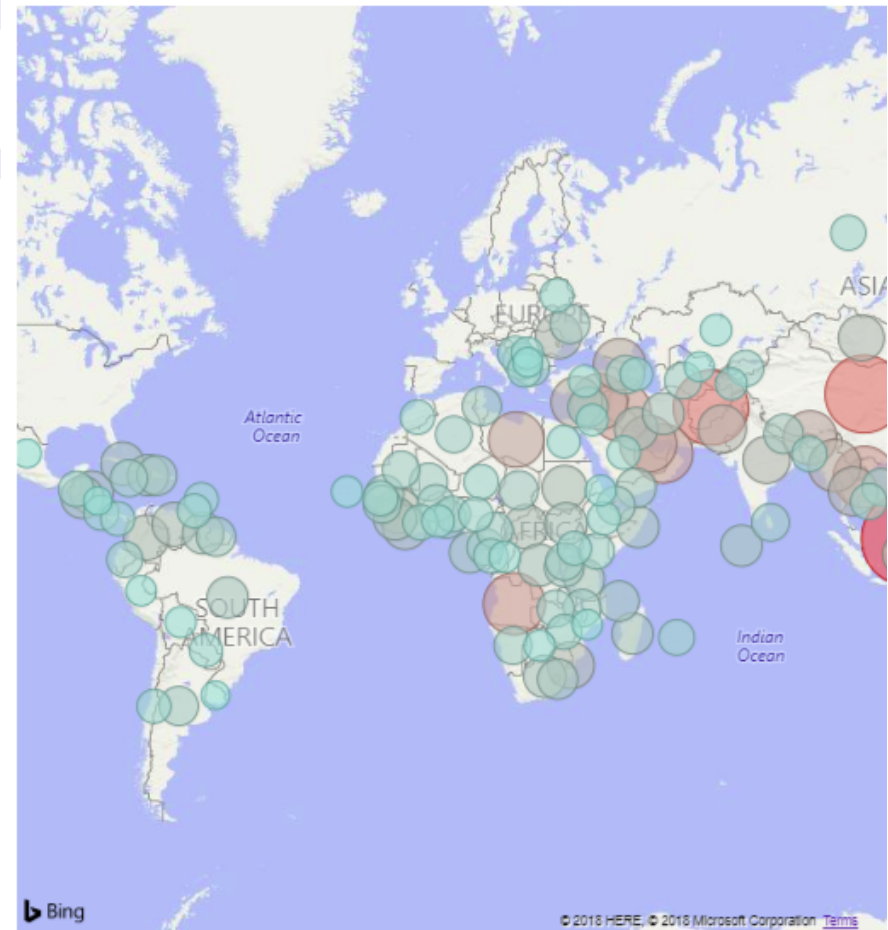




# Dashboard

## Purchase Orders (2016 - Q3 2018)

Region	Possible Issues	Total No of POs	Unused POs
<input type="checkbox"/> RBA <input type="checkbox"/> RBAP <input type="checkbox"/> RBAS <input type="checkbox"/> RBEC <input type="checkbox"/> RBLAC	22.63K	69K	2597
RAC	Issue Amount	Total PO Amt	Cancelled Amt
<input type="checkbox"/> RAC-AP <input type="checkbox"/> RAC-ECME <input type="checkbox"/> RAC-ESA <input type="checkbox"/> RAC-LAC <input type="checkbox"/> RAC-NWCA	\$798.65M	\$1.41bn	\$196.23M
Year			
	2018	2017	2016





# Dashboard

## Country Review

### Region

- ☐ Select All
- ☐ RBA
- ☐ RBAP
- ☐ RBAS
- ☐ RBEC
- ☐ RBLAC

### Year

2018

2017

2016

### Compliance

No of Issues

1712

Amount

\$48.77M

### Timeliness

No of Issues

11K

Amount

\$344.17M

### Red Flag

No of Issues

9204

Amount

\$612.87M

### Effectiveness

No of Issues

339

Amount

\$25.76M

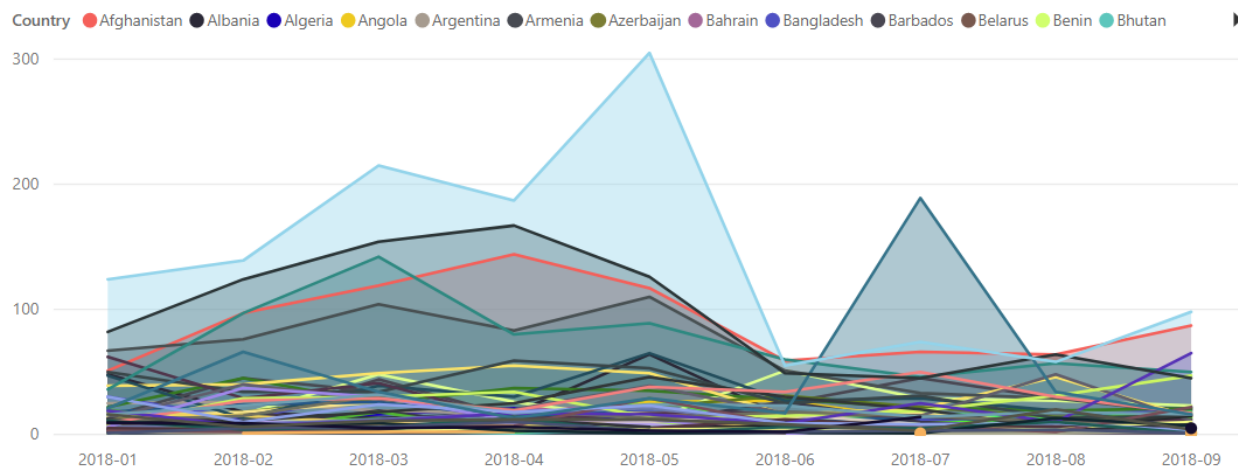
### RAC

- ☐ Select All
- ☐ RAC-AP
- ☐ RAC-ECME
- ☐ RAC-ESA
- ☐ RAC-LAC
- ☐ RAC-NWCA

### BU

- ☐ Select All
- ☐ Afghanistan
- ☐ Albania
- ☐ Algeria
- ☐ Angola
- ☐ Argentina
- ☐ Armenia
- ☐ Azerbaijan
- ☐ Bahrain
- ☐ Bangladesh
- ☐ Barbados
- ☐ Belarus
- ☐ Benin
- ☐ Bhutan
- ☐ Bolivia
- ☐ Bosnia and He...

### PO Issues by Month



### Number of POs with Issues

Total No. of POs

69016

Compliance

1712

Timeliness

11375

RF

9204

Effectiveness

339



# Dashboard

Region	Country	Year	Category	Note
<input type="checkbox"/> Select All <input checked="" type="checkbox"/> RBAS	<input type="checkbox"/> Iraq <input type="checkbox"/> Jordan <input type="checkbox"/> Kuwait <input type="checkbox"/> Lebanon <input type="checkbox"/> Libya <input type="checkbox"/> Morocco <input type="checkbox"/> Palestina <input type="checkbox"/> Saudi Arabia <input type="checkbox"/> Somalia <input type="checkbox"/> Sudan <input checked="" type="checkbox"/> Syria <input type="checkbox"/> Tunisia <input type="checkbox"/> United Arab ... <input type="checkbox"/> Yemen	<div>2018</div> <div>2017</div> <div>2016</div>	<div>Compliance</div> <div>Effectiveness</div> <div><b>Red Flag</b></div> <div>Timeliness</div>	<div>1. Select a BU and Control(s)</div> <div>2. Select year and adjust date interval using "Issue Timeline", if necessary</div>
<div>RAC</div> <div> <input type="checkbox"/> Select All  <input type="checkbox"/> RAC-ECME         </div>			<div>Controls</div> <div> <input type="checkbox"/> Select All  <input type="checkbox"/> Outliers (absolute) - highest PO \$20,000 higher than second highest for...  <input type="checkbox"/> Outliers (relative) - highest PO 5 times higher than second highest for t...  <input type="checkbox"/> POs close to Approval Levels - Man 1 / Man2  <input type="checkbox"/> POs close to CAP / ACP Approval Level  <input type="checkbox"/> Possible Split POs (Multiple POs for the same Vendor created the same ...         </div>	<div>Issue Timeline</div> <div> <div>12/31/2016</div> <div>9/30/2018</div> <div> <input type="text"/> </div> </div> <div>No. of selected POs (distinct)</div> <div>68</div>

PO BU + PO	Control	Related PO	Vendor ID ▲	Vendor Name	Vendor SetID	Vendor Class	PO Reference	PO Amt Curr	Currency
014-00000010002	Possible Split POs Multiple POs for the same Vendor in...	1	0000000004	00000000047	01400	Sup-Proc	Fuel for Hesp Trip	5,497.00	USD
014-00000010004	Possible Split POs Multiple POs for the same Vendor in...	2	0000000004	00000000047	01400	Sup-Proc	Fuel for Hespera Reg	5,497.00	USD
014-00000010005	Outlier identified - Highest PO \$20,000 higher than sec...	1	0000000005	02100	01400	Supplier	10 Insects - Contract 000	200,170.00	USD
014-00000010010	Outlier identified - Highest PO \$20,000 higher than sec...	2	0000000005	02100	01400	Supplier	Additional Dissection	40,000.00	USD
014-00000010006	POs close to LAF / ACP Approval Limit		0000000005	0400 HCTEL HOME	01400	Supplier	Safe Hotel extension	40,000.00	USD
014-00000010016	Outlier identified - Highest PO \$20,000 higher than sec...	1	0000000005	AL HANSEN PROPOSED FOR THOMPSON MCHC...	01400	Supplier	Salaries of 20 Project Admins	395,740,000.00	CHF
014-00000010007	Possible Split POs Multiple POs for the same Vendor in...	1	0000000005	AL HANSEN PROPOSED FOR THOMPSON MCHC...	01400	Supplier	Salaries for Hespera Project	10,000.00	CHF
014-00000010008	Possible Split POs Multiple POs for the same Vendor in...	2	0000000005	AL HANSEN PROPOSED FOR THOMPSON MCHC...	01400	Supplier	20-140-147-148-110 Hespera Sale	52,740,000.00	CHF
014-00000010011	Outlier identified - Highest PO \$20,000 higher than sec...	1	0000000005	AL HANSEN PROPOSED FOR THOMPSON MCHC...	01400	Supplier	Protection for Life Saving	204,000,000.00	CHF
014-00000010011	Possible Split POs Multiple POs for the same Vendor in...	1	0000000005	AL HANSEN PROPOSED FOR THOMPSON MCHC...	01400	Supplier	Protection for Life Saving	204,000,000.00	CHF
014-00000010012	Possible Split POs Multiple POs for the same Vendor in...	2	0000000005	AL HANSEN PROPOSED FOR THOMPSON MCHC...	01400	Supplier	Protection for Life Saving - 2	20,200,200.00	CHF
014-00000010009	Outlier identified - Highest PO \$20,000 higher than sec...	1	0000000007	ARTURE TECHNOLOGY - MICROBIAL LABS...	01400	Supplier	FB 040-10 0402 sewage treatment	36,207,000.00	CHF
014-00000010010	Outlier identified - Highest PO \$20,000 higher than sec...	2	0000000007	ARTURE TECHNOLOGY - MICROBIAL LABS...	01400	Supplier	010 040-10	26,000,000.00	CHF
014-00000010010	Outlier identified - Highest PO 3 times higher than sec...	1	0000000008	DAUMAG YOUTH CHURCH	01400	Supplier	Work shop - Nat Demography Prog	1,000,000.00	CHF
014-00000010010	Outlier identified - Highest PO 3 times higher than sec...	1	0000000008	DAUMAG YOUTH CHURCH	01400	Supplier	GA 2/1/2016	149,010.00	USD
014-00000010010	POs close to LAF / ACP Approval Limit		0000000008	DAUMAG YOUTH CHURCH	01400	Supplier	GA 2/1/2016	149,010.00	USD
014-00000010009	POs close to LAF / ACP Approval Limit		0000000008	DAUMAG YOUTH CHURCH	01400	Supplier	GA 1/1/2016	149,010.00	USD
014-00000010010	Outlier identified - Highest PO \$20,000 higher than sec...	1	0000000009	ACA GRASS FOUNDATION CHINA	01400	Supplier	UNEP 216-004-116-17	714,007.00	USD
014-00000010009	Outlier identified - Highest PO \$20,000 higher than sec...	2	0000000009	ACA GRASS FOUNDATION CHINA	01400	Supplier	UNEP 216-004-116-17 Second...	514,000.00	USD
014-00000010002	Outlier identified - Highest PO 3 times higher than sec...	1	0000000009	ARTILLERIE ATTACHE POWER SYSTEMS	01400	Supplier	Amendment to PO 9202 Service	440,000.00	USD
014-00000010002	Possible Split POs Multiple POs for the same Vendor in...	1	0000000009	ARTILLERIE ATTACHE POWER SYSTEMS	01400	Supplier	Amendment to PO 9202 Service	440,000.00	USD
014-00000010004	Possible Split POs Multiple POs for the same Vendor in...	2	0000000009	ARTILLERIE ATTACHE POWER SYSTEMS	01400	Supplier	Amendment to PO 9209-46 Data	370,000.00	USD





# Audit Monitoring Dashboard

## AUDIT MONITORING DASHBOARD

Report Refresh Date&Time

15-Nov-18 10:08 AM

Quality Assurance and Policy Unit  
Office of Audit and Investigations



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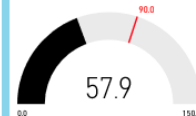
### Weekly Status Update of Ongoing Audits

OAI Unit	Audit ID	Title	Rating	Audit Type1	Audit Work End	Who has it?	As of When	Draft Report to CO	Receipt of Mgmt Comments	Report to QA	No. of days lapsed after end of fieldwork	Weekly Status
OAI/ACTAS	2015	ICT Governance	Partially Satisfactory /SI	ICT	28-Sep-18	Auditee	14-Nov-18				48	
OAI/RAC-ESA	2003	UNDP Kenya	Partially Satisfactory /MI	Country Office	02-Oct-18	Auditee	11-Nov-18				44	Draft report submitted to CO for comments, due back 16 Nov 2018
OAI/RAC-NWCA	1925	UNDP Gambia	Unsatisfactory	Country Office	05-Oct-18	Auditee	01-Nov-18	31-Oct-18	01-Nov-18	01-Nov-18	41	Comments from CO expected by 15 November 2018.
OAI/RAC-ESA	2014	UNDP Uganda	Partially Satisfactory /MI	Country Office	05-Oct-18	Auditee	08-Nov-18				41	Draft report submitted to CO for comments, due back 16 Nov 2018
OAI/RAC-AP	2007	UNDP Democratic People's Republic of Korea	Partially Satisfactory /MI	Country Office	08-Oct-18	QA	15-Nov-18				38	Drafting report
OAI/RAC-LAC	2004	UNDP Venezuela	Partially Satisfactory /SI	Country Office	12-Oct-18	Auditee	13-Nov-18				34	AR at the CO for their comments / plan of action. Expected back at RAC LAC by 23 November.
OAI/RAC-ECME	2010	UNDP Yemen	Country Office	17-Oct-18	OAI Section	17-Oct-18					29	The audit report is drafted for sharing with the management by 20 November.
OAI/RAC-AP	2000	UNDP Lao PDR	Partially Satisfactory /SI	Country Office	02-Nov-18	Auditee	15-Nov-18				19	Fieldwork ended on 7 November 2018
OAI/ACTAS	2029	Management of outsourced ICT services	ICT	30-Nov-18	OAI Section	05-Nov-18					15	

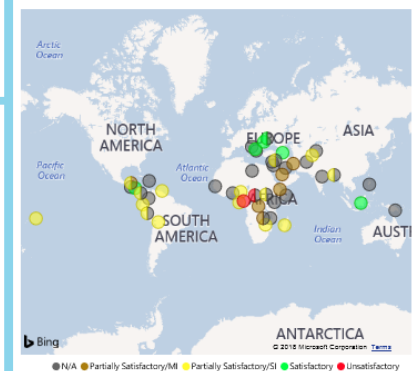
### Ongoing audits 2018

10

### Ave. No. of Days to Issue Re... 2018



### Country Offices and Overall Audit Ratings 2018



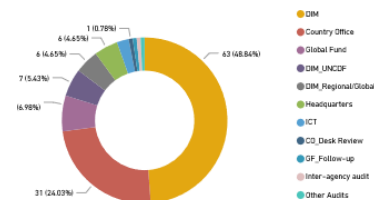
### Approved AWP

104

### Revised AWP

113

### Revised Annual Work Plan (2018)



### Audit reports issued 2018 - INCLUDING UNWOMEN

104

### Total audited expenditure 2018

\$2,536M

### Status of DIM Audits (Who has it?) - 2018

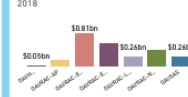
### AWP Status - Audit types

Audit Type1	Original	Addition	Cancelled	Total AWP
CO Desk Review	1			1
Country Office	30	1		31
DIM	44	19	-10	53
DIM Regional/Global	5	1		6
DIM UNCDF	7		-2	5
<b>Total</b>	<b>104</b>	<b>25</b>	<b>-16</b>	<b>113</b>

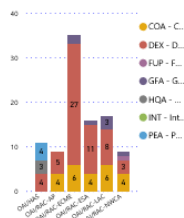
### No. of redacted reports 2018

4

### Audited expenditure by OAI... 2018



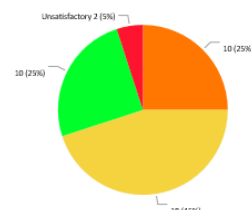
### Audit reports issued (2018) BY OAI UNIT, TYPE



### No. of reports issued and ratings 2018

Audit Type2	N/A	Partially Satisfactory/MI	Partially Satisfactory/SI	Satisfactory	Unsatisfactory	Total
COA - CO Audit		6	10	6	2	24
DEX - DEX Audit	58					58
FUP - Follow-up Audit	1					1
GIA - GRAIM Audit	2	1	6			9
HQA - HQx Audit		1	1	2		4
INT - Inter-agency Audit	1					1
PEA - Performance Audit		2	1	1		4
<b>Total</b>	<b>62</b>	<b>10</b>	<b>18</b>	<b>10</b>	<b>2</b>	<b>102</b>

### Audit report ratings 2018



### Audited expenditure and no... 2018

Audit Type2	Count of Audit ID	Audit
COA - CO Audit	24	
DEX - DEX Audit	58	
FUP - Follow-up Audit	1	
GIA - GRAIM Audit	9	
HQA - HQx Audit	4	
INT - Inter-agency Audit	1	
PEA - Performance Audit	4	
<b>Total</b>	<b>102</b>	<b>\$</b>

### Report Status - DIM Audits (Who has it?) 2018

OAI Unit	Total
----------	-------



# Audit Monitoring Dashboard

## AUDIT REPORT RATINGS

Issue Date

1/1/2017

9/30/2017

OAI Unit

All

Rating

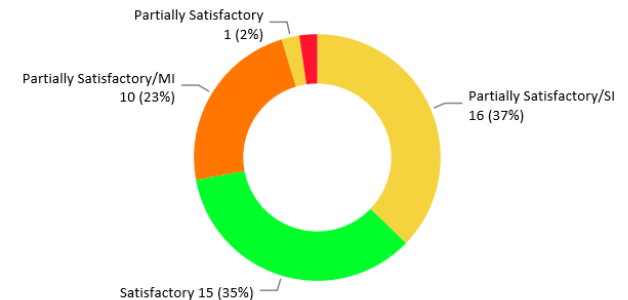
(Multiple Selections)

Audit Type2

(Multiple Selections)

Audit ID	Title	OAI Unit	Rating	Audit Type1	Audit Type2	Issue Date	Bureau
1738	UNDP Guinea	OAI/RAC-NW...	Partially Satisfactory	Country Offi...	COA - CO Au...	06-Jan-17	RBA
1724	UNDP El Salvador	OAI/RAC-LAC/	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	24-Feb-17	RBLAC
1740	UNDP Tunisia	OAI/RAC-NW...	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	03-Feb-17	RBAS
1752	UNDP Guyana	OAI/RAC-LAC/	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	20-Apr-17	RBLAC
1761	UNDP Sudan - Global Fund	OAI/RAC-ECM...	Partially Satisfactory/MI	Global Fund	GFA - GFATM...	28-Apr-17	RBAS
1762	UNDP Pakistan	OAI/RAC-AP/	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	31-Mar-17	RBAP
1768	UNDP Cameroon	OAI/RAC-NW...	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	18-May-17	RBA
1770	UNDP Swaziland	OAI/RAC-ESA/	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	24-May-17	RBA
1773	UNDP Vietnam	OAI/RAC-AP/	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	09-Jun-17	RBAP
1830	UNDP Benin	OAI/RAC-NW...	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	10-Jul-17	RBA
1881	UNDP Sierra Leone	OAI/RAC-ESA/	Partially Satisfactory/MI	Country Offi...	COA - CO Au...	25-Aug-17	RBA
1747	UNDP Libya	OAI/RAC-NW...	Partially Satisfactory/SI	Country Offi...	COA - CO Au...	25-Jan-17	RBAS
1750	UNDP Resource Mobilization Management	OAI/HAS/	Partially Satisfactory/SI	Headquarters	PEA - Perfor...	30-Jun-17	0

Audit Ratings



Rating	Qtr 1	Qtr 2	Qtr 3	Total
Partially Satisfactory	1			1
Partially Satisfactory/MI	3	5	2	10
Partially Satisfactory/SI	3	9	4	16
Satisfactory	3	3	9	15
Unsatisfactory	1			1
<b>Total</b>	<b>11</b>	<b>17</b>	<b>15</b>	<b>43</b>

Rating	Country Office	Global Fund	Headquarters	Total
Partially Satisfactory	1			1
Partially Satisfactory/MI	9	1		10
Partially Satisfactory/SI	9	2	5	16
Satisfactory	9	3	3	15
Unsatisfactory		1		1
<b>Total</b>	<b>28</b>	<b>7</b>	<b>8</b>	<b>43</b>

Rating ● Partially Satisfactory ● Partially Satisfactory/MI ● Partially Satisfactory/SI ● Satisfactory





# Thank you !



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