

Monitoring and Evaluation Analysis 1 (Last Updated: April 9, 2013)

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This reference demonstrates how DevTreks can be used to monitor and evaluate projects and programs.

A. Introduction

This example combines DevTreks' standard economic evaluation framework (i.e. budgets) with a new monitoring and evaluation (M&E) framework. The DevTreks reference, *Monitoring and Evaluation 1: Food Nutrition* introduces the background logic for M&E analysis in DevTreks. This reference documents how to complete a full M&E analysis using new M&E calculators and analyzers. DevTreks treats the monitoring and evaluation of projects and programs as a type of Capital Program (see GAO, 2009) that requires the use of "best practices" for managing data to achieve cost effective results.

B. Data

Our initial literature review did not find a completed M&E data set that could be used in this analysis. The references found in the introductory M&E reference suggest these data sets (i.e. see below) don't exist yet. We chose to use representative, but fictitious, data for a Malnutrition Improvement project. We'll continue to look for a real data set. We also chose to use URIs to exemplify how calculators and analyzers work with all M&E elements. DevTreks believes that if data can't be accessed and analyzed with a URI, it mustn't be important to the data collector or user.

The exclusive goal of this data was to demonstrate how M&E analysis works. For the purpose of this reference, the economic numbers associated with each M&E element, such as prices, revenues and costs, were of secondary importance. DevTreks recommends that real M&E analysis treat the economic numbers just as seriously as the M&E numbers. Future references will explain how both sets of data can be used together to achieve more effective results.

C. Work Breakdown Structure

DevTreks recommends using standard Work Breakdown Structures (WBS) to structure data. The WBS labels are used to aggregate and analyze data for all clubs throughout a network. A complete WBS for malnutrition interventions does not exist (to the author's knowledge). Each of the M&E element sections below include the WBS used with the data. All of the data used in this analysis, including the indicators, were aggregated using these labels. Although the examples below show the same labels being used by both an M&E element and its associated indicators, the two labels can be different.

D. Calculations

Separate M&E calculators are available for each M&E element, including Inputs, Outputs, Operations, Components, Outcomes, Operating Budgets, and Capital Budgets. Indicators can be added to each sub element within each element. For example, an Input M&E element can have indicators for the Input Group, Input, and Input Series sub elements. Operating Budgets can have indicators for the Budget Group, Budget, and Time Period sub elements.

Version 1.3 uses one consistent set of properties for all indicators. These properties are defined in the DevTreks reference, *Monitoring and Evaluation 1: Food Nutrition*. Each M&E element can include up to 20 indicators that define Benchmark, Full Target, Partial Target, and Actual amounts.

The following image displays a typical indicator's properties:

Intro	1	2	3	Help
Step 1 of 3. Make Selections				
<input type="button" value="Get Selects"/> <input type="button" value="Cancel"/> <input type="button" value="Close"/>				
Calculator Name				
Monitoring and Evaluation 1 Input Calculator				
M and E Indicators				
<input type="button" value="Indicator 1"/>				
Labor, Benchmark Training				
Indicator 1 Description				
This indicator measures the benchmark amount of staff time spent delivering nutrition workshops. The initial staff time spent on training is zero hours.				
Label 1		Indicator Type 1		
I121		benchmark		
Date 1		Price Type 1		
2013-03-12T00:00:00		operating		
Degree Rating 1		Math Type 1		
low		Q1_multiply_Q2		
Amount A 1		Unit A 1		
0.00		hours		
Amount B 1		Unit B 1		
30.00		dollars		
Total 1		Total Unit 1		

Most M&E calculations will have multiple Partial Target indicators for partial target periods, such as monthly, quarterly, or semiannually. Each of these partial target periods will include one or more Actual indicators that sum the actual accomplishments for the period.

The following images displays six Input indicators that measure progress over two quarterly periods.

Indicator Name	Label	Indic Type	Date
Indic 1 Name: Labor, Benchmark Training Indic 1 Price Type: oc Indic 1 Degree Type: low Indic 1 Math Type: Q1_multiply_Q2 Indic 1 Q1 Amount: 0.00 Indic 1 Q2 Amount: 30.00 Indic 1 Total: 0.00 Indic 1 Description: This indicator measures the benchmark amount of staff time spent delivering nutrition workshops. The initial staff time spent on training is zero hours.	Indic 1 Label: I121	Indic 1 Indic Type: benchmark	Indic 1 Date: 2013-03-12T00:00:00
Indic 2 Name: Labor, Full Target Training Indic 2 Price Type: oc Indic 2 Degree Type: low Indic 2 Math Type: Q1_multiply_Q2 Indic 2 Q1 Amount: 2500.00 Indic 2 Q2 Amount: 30.00 Indic 2 Total: 75000.00 Indic 2 Description: This indicator measures the full target amount of staff time spent delivering nutrition workshops. The full target staff time to spend on training is 2500 hours over one year.	Indic 2 Label: I121	Indic 2 Indic Type: fulltarget	Indic 2 Date: 2014-03-12T00:00:00
Indic 3 Name: Labor, Q1 Partial Target Training Indic 3 Price Type: oc Indic 3 Degree Type: low Indic 3 Math Type: Q1_multiply_Q2 Indic 3 Q1 Amount: 250.00 Indic 3 Q2 Amount: 30.00 Indic 3 Total: 7500.00 Indic 3 Description: This indicator measures the Q1 partial target amount of staff time spent delivering nutrition workshops. The partial target staff time to spend on training is 250 hours.	Indic 3 Label: I121	Indic 3 Indic Type: partialtarget	Indic 3 Date: 2013-06-12T00:00:00
Indic 4 Name: Labor, Q2 Partial Target Training Indic 4 Price Type: oc Indic 4 Degree Type: low Indic 4 Math Type: Q1_multiply_Q2 Indic 4 Q1 Amount: 1000.00 Indic 4 Q2 Amount: 30.00 Indic 4 Total: 30000.00 Indic 4 Description: This indicator measures the Q2 partial target amount of staff time spent delivering nutrition workshops. The partial target staff time to spend on training is 1000 hours.	Indic 4 Label: I121	Indic 4 Indic Type: partialtarget	Indic 4 Date: 2013-09-12T00:00:00
Indic 5 Name: Labor, Q1 Actual Training Indic 5 Price Type: oc Indic 5 Degree Type: low Indic 5 Math Type: Q1_multiply_Q2 Indic 5 Q1 Amount: 175.00 Indic 5 Q2 Amount: 35.00 Indic 5 Total: 6125.00 Indic 5 Description: This indicator measures the Q1 actual amount of staff time spent delivering nutrition workshops. Staff spent 175 / 250 or 70% of the partial target.	Indic 5 Label: I121	Indic 5 Indic Type: actual	Indic 5 Date: 2013-06-10T00:00:00
Indic 6 Name: Labor, Q2 Actual Training Indic 6 Price Type: oc Indic 6 Degree Type: low	Indic 6 Label: I121	Indic 6 Indic Type: actual	Indic 6 Date: 2013-09-10T00:00:00

The same indicator, such as I121 Labor for Training, can be added to more than one M&E element. For example, a two year project may use two separate Inputs to keep track of the same indicators.

E. Analyses

Separate M&E analyzers are available for each M&E element, including Inputs, Outputs, Operations, Components, Outcomes, Operating Budgets, and Capital Budgets. Analyzers measure the actual progress achieved for each partial target indicator. Each analysis will display up to 10 partial target indicators for each separate M&E element. Analyzers can include up to three demographic groups (i.e. malnourished group 1, 2, and 3), containing up to five demographic properties (age, height, weight, calorie intake, income).

The following images display a typical analyzer's properties:

Name	Label
Midterm Female Children,	120A

Description

50% of this targeted population suffered from severe nutrition when the project started. Those numbers have improved as shown in the accompanying indicators.

Name A	Amount A
age	2.5

Unit A

years

Name B	Amount B
weight	25

Intro	1	2	3	Help
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Step 2 of 3. Analyze

What If Tag

Choose either a specific resource calculator, or the type of resource calculator to analyze. If both are chosen, the specific calculation selection will be used.

Base Resource (Input) Calculations To Analyze Type:

Monitoring and Evaluation 1 ▼

Compare Using:

Aggregate Using:

What If Tag

Description

This midterm evaluation measure the progress in achieving the project's malnutrition improvement goals. v130a

Operating Budget Group : M and E Malnutrition Projects

Operating Budget : Malnutrition Project 01

← **Indicator Totals**

Although each sub element within an M&E element can be linked to an analyzer (i.e. an Input Series), most analyses will be completed using a grouping sub element, such as an Input Group, Output Group, Operation Group, Component Group, Outcome Group, Operating Budget Group, Capital Budget Group, Operating Budget, or Capital Budget. The last image shows that M&E elements can be aggregated using several options:

Compare Using: Version 1.3 does not include comparative analysis.

Aggregate Using: The *Labels* option will aggregate data together using Work Breakdown Structure labels. This usually results in the most detailed aggregation. All economic content in DevTreks is stored using a table named Types at the top level of the data hierarchy (i.e. Operation Type) and a table named Group at the next level of the hierarchy (Operation Group). The *Type* option aggregates

data using the Type's table Id property. This usually results in the least detailed aggregation. The *Group* option aggregates data using the Group's table Id property. This usually results in data that is aggregated somewhere in between the *Labels* option and the *Types* option. Only the *Labels* option can be used to aggregate data coming from different clubs.

In a budget analysis, these aggregations take place in three stages. The first stage aggregates elements using the budget M&E elements (Budget Type, Budget Group, Budget, and Time Period). The second stage aggregates M&E elements using the Outcomes, Operations, and Components. The third stage aggregates the indicators, using indicator labels only, within each aggregated M&E element. Analyses for the remaining M&E elements (Operations, Components, Outcomes, Inputs and Outputs) use only the last two stages. We expect to refine these stages in future releases.

The following Outcome analysis displays the progress achieved for several M&E element indicators over two quarterly periods.

Outcome : Consumption of Nutritious Meals

Indicator Totals

Indicator 1 Name : Q1 Partial Target Percent Population Eating Healthy	Type : partialtarget
Label : OC120	Actual Unit : percent eating healthy
Actual Total : 25.00	Actual Date : 2013-06-10T00:00:00
Benchmark Total : 20.00	Benchmark Percent : 125.00
Partial Target Total : 20.00	Partial Target Date : 2013-06-12T00:00:00
Partial Target Percent : 125.00	
Full Target Total : 75.00	Full Target Percent : 33.33
Description : The Q1 partial target percentage of the targeted population engaged in targeted eating meals that meet food nutrition target is 20%,	
Indicator 2 Name : Q2 Partial Target Percent Population Eating Healthy	Type : partialtarget
Label : OC120	Actual Unit : percent eating healthy
Actual Total : 45.00	Actual Date : 2013-09-10T00:00:00
Benchmark Total : 20.00	Benchmark Percent : 225.00
Partial Target Total : 40.00	Partial Target Date : 2013-09-12T00:00:00
Partial Target Percent : 112.50	
Full Target Total : 75.00	Full Target Percent : 60.00
Description : The Q2 partial target percentage of the targeted population engaged in targeted eating meals that meet food nutrition target is 40%,	

Output : 2013 Nutrition Training Workshops

Indicator Totals

Indicator 1 Name : Q1 Partial Target Passing Nutrition Grades	Type : partialtarget
Label : O121	Actual Unit : percent passing score
Actual Total : 20.00	Actual Date : 2013-06-10T00:00:00
Benchmark Total : 15.00	Benchmark Percent : 133.33
Partial Target Total : 25.00	Partial Target Date : 2013-06-12T00:00:00
Partial Target Percent : 80.00	
Full Target Total : 70.00	Full Target Percent : 28.57
Description : Quarter 1's partial target for	

Actual Total is a summation of all of the indicators within a partial period that have an *IndicatorType* property of *Actual*. *Benchmark Total* is the initial amount of the indicator being measured. *Benchmark Percent* equals $Actual\ Total / Benchmark\ Total$. *Partial Target Total* is the partial target amount of the indicator being measured for a partial target period. *Partial Target Percent* equals $Actual\ Total / Partial\ Target\ Total$. *Full Target Total* is the full target amount of the indicator being measured. *Full Target Percent* equals $Actual\ Total / Full\ Target\ Total$. Actual indicators must have a date that is less than the current partial target date, and greater than or equal to a previous partial target date.

F. Inputs

<http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Malnutrition Inputs/2651/none/>

Data Structure

The following WBS was used to classify inputs.

Type: T120. Food Nutrition

Group: IG120. M and E Malnutrition Education Group

Input: I120. 2013 Nutrition Training Manual Development

Input Series: I120. 2013 Nutrition Training Manual Development

Indicator 1: I120. Training Material Development Labor

Input: I121. 2013 Nutrition Training Workshop

Input Series: I121. 2013 Nutrition Training Workshop

Indicator 1: I121. Training Labor

Input M&E Calculator URI

[http://devtreks.cloudapp.net/hometreks/preview/farmworkers/input/2013 Nutrition Training Manual Development/2147397488/none/](http://devtreks.cloudapp.net/hometreks/preview/farmworkers/input/2013%20Nutrition%20Training%20Manual%20Development/2147397488/none/)

Input M&E Analyzer URI

With the exception of Inputs and Outputs, analyses in DevTreks require running a base Net Present Value calculator before the analysis can be run.

[http://devtreks.cloudapp.net/hometreks/preview/farmworkers/inputgroup/M and E Malnutrition Education Group/2126772311/none/](http://devtreks.cloudapp.net/hometreks/preview/farmworkers/inputgroup/M%20and%20E%20Malnutrition%20Education%20Group/2126772311/none/)

G. Outputs

[http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Malnutrition Outputs/2656/none/](http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M%20and%20E%20Malnutrition%20Outputs/2656/none/)

Data Structure

The following WBS was used to classify outputs.

Type: T120. Food Nutrition

Group: OG120. M and E Nutrition Training and Practice

Output: O121. 2013 Nutrition Training Workshops

Output Series: O121. 2013 Nutrition Training Workshops

Indicator 1: O121. Passing Nutrition Grades

Output: O120. 2013 Nutritious Meals Consumed

Output Series: O120. 2013 Nutritious Meals Consumed

Indicator 1: O120. Daily Nutrition Target Days Per Month

Output M&E Calculator URI

[http://devtreks.cloudapp.net/hometreks/preview/farmworkers/output/2013 Nutrition Training Workshops/2141223442/none/](http://devtreks.cloudapp.net/hometreks/preview/farmworkers/output/2013%20Nutrition%20Training%20Workshops/2141223442/none/)

Output M&E Analyzer URI

With the exception of Inputs and Outputs, analyses in DevTreks require running a base Net Present Value calculator before the analysis can be run.

[http://devtreks.cloudapp.net/hometreks/preview/farmworkers/outputgroup/M and E Nutrition Training and Practice/1936433720/none/](http://devtreks.cloudapp.net/hometreks/preview/farmworkers/outputgroup/M%20and%20E%20Nutrition%20Training%20and%20Practice/1936433720/none/)

H. Operations

[http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Malnutrition Operations/2654/none/](http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M%20and%20E%20Malnutrition%20Operations/2654/none/)

Data Structure

The following WBS was used to classify operations.

Type: T120. Food Nutrition

Group: OPG120. M and E Malnutrition Training

Operation 1: OP121. 2013 Conduct Training Workshops

Indicator 1: OP121. Workshops Held

Input 1: I121. 2013 Nutrition Training Workshop

Indicator 1: I121. Training Labor

Operation 2: OP120. 2013 Develop Nutrient Training Materials

Indicator 1: OP120. Training Materials Completed

Input 1: I120 2013 Nutrition Training Manual Development

Indicator 1: I120. Training Material Development Labor

Operation M&E Calculator URI

[http://devtreks.cloudapp.net/hometreks/preview/farmworkers/operation/2013 Conduct Training Workshops/2091557250/none/](http://devtreks.cloudapp.net/hometreks/preview/farmworkers/operation/2013%20Conduct%20Training%20Workshops/2091557250/none/)

Operation M&E Analyzer URI

With the exception of Inputs and Outputs, analyses in DevTreks require running a base Net Present Value calculator before the analysis can be run.

[http://devtreks.cloudapp.net/hometreks/preview/farmworkers/operationgroup/M and E Malnutrition Training/754/none/](http://devtreks.cloudapp.net/hometreks/preview/farmworkers/operationgroup/M%20and%20E%20Malnutrition%20Training/754/none/)

I. Components

[http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Malnutrition Components/2650/none/](http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M%20and%20E%20Malnutrition%20Components/2650/none/)

Data Structure

For expediency, the WBS for Operations was used with this data.

Component M&E Calculator URI

[http://devtreks.cloudapp.net/hometreks/preview/farmworkers/component/2013 Conduct Training Workshops/1162/none/](http://devtreks.cloudapp.net/hometreks/preview/farmworkers/component/2013%20Conduct%20Training%20Workshops/1162/none/)

Component M&E Analyzer URI

With the exception of Inputs and Outputs, analyses in DevTreks require running a base Net Present Value calculator before the analysis can be run.

<http://devtreks.cloudapp.net/hometreks/preview/farmworkers/componentgroup/M and E Nutrition Training/654/none/>

J. Outcomes

<http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Malnutrition Outcomes/2655/none/>

Data Structure

The following WBS was used to classify outcomes.

Type: T120. Food Nutrition

Group: OCG120. Nutrition Education and Practices

Outcome 1: OC120. Consumption of Nutritious Meals

Indicator 1: OC120. Percent Population Eating Healthy

Output 1: O121. 2013 Nutrition Training Workshops

Indicator 1: O121. Passing Nutrition Grades

Output 2: O120. 2013 Nutritious Meals Consumed

Indicator 1: O120. Daily Nutrition Target Days Per Month

Outcome M&E Calculator URI

<http://devtreks.cloudapp.net/hometreks/preview/farmworkers/outcome/Consumption of Nutritious Meals/5740/none/>

Outcome M&E Analyzer URI

With the exception of Inputs and Outputs, analyses in DevTreks require running a base Net Present Value calculator before the analysis can be run.

<http://devtreks.cloudapp.net/hometreks/preview/farmworkers/outcomegroup/Nutrition Education and Practices/34/none/>

K. Operating Budgets

<http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Malnutrition Op Budgets/2653/none/>

Data Structure

The following WBS was used to classify operating budgets.

Type: T120. Food Nutrition

Group: BG120. M and E Malnutrition Projects

Budget 1: B120. Malnutrition Project 1. The goal of this project is to reduce malnutrition in a targeted population. Children in the targeted population suffer from malnutrition.

Time Period 1: TP120. 2013 Malnutrition Improvement Progress

Indicator 1: TP120. Nutrition-Related Health Improvements

Demographic 1: 120A. Female Children

Demographic 2: 120B. Male Children

Outcome 1: OC120. Consumption of Nutritious Meals

Indicator 1: OC120. Percent Population Eating Healthy

Output 1: O121. 2013 Nutrition Training Workshops

Indicator 1: O121. Passing Nutrition Grades

Output 2: O120. 2013 Nutritious Meals Consumed

Indicator 1: O120. Daily Nutrition Target Days Per Month

Operation 1: OP121. 2013 Conduct Training Workshops

Indicator 1: OP121. Workshops Held

Input 1: I121. 2013 Nutrition Training Workshop

Indicator 1: I121. Training Labor

Operation 2: OP120. 2013 Develop Nutrient Training Materials

Indicator 1: OP120. Training Materials Completed

Input 1: I120 2013 Nutrition Training Manual Development

Indicator 1: I120. Training Material Development Labor

Operating Budget M&E Calculator URI

<http://devtreks.cloudapp.net/hometreks/preview/farmworkers/budgettimeperiod/2013, Malnutrition Improvement Progress/5737/none/>

Operating Budget M&E Analyzer URI

With the exception of Inputs and Outputs, analyses in DevTreks require running a base Net Present Value calculator before the analysis can be run.

<http://devtreks.cloudapp.net/hometreks/preview/farmworkers/budget/Malnutrition Project 01/273083898/none/>

L. Capital Budgets

<http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Malnutrition Investments/2652/none/>

Data Structure

For expediency, the WBS for Operating Budgets was used with this data.

Capital Budget M&E Calculator URI

<http://devtreks.cloudapp.net/hometreks/preview/farmworkers/investmenttimeperiod/2013 Malnutrition Progress/2108448208/none/>

Capital Budget M&E Analyzer URI

With the exception of Inputs and Outputs, analyses in DevTreks require running a base Net Present Value calculator before the analysis can be run.

<http://devtreks.cloudapp.net/hometreks/preview/farmworkers/investment/Malnutrition Project 01/417/none/>

M. M&E Multimedia (Resources)

[http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Media/2649/none](http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M%20and%20E%20Media/2649/none)

Most of the multimedia used in Version 1.3 is used to display the M&E calculator and analyzers and their results. Full multimedia should include pictures and videos that support the stories that must accompany each analysis.

N. M&E Stories (Linked Views)

[http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M and E Calculators and Analyzers/2648/none/ /](http://devtreks.cloudapp.net/hometreks/select/farmworkers/servicebase/M%20and%20E%20Calculators%20and%20Analyzers/2648/none/)

Most of the linked views used in Version 1.3 are not stories, they are M&E calculators and analyzers. But stories are particularly important in monitoring and evaluation analysis because the quantitative indicators being measured can be difficult to grasp in total. At least one summary story should be linked to all analyses explaining what the M&E results mean. The richer the story, the easier it will be to grasp what a project's trying to accomplish and whether or not it is succeeding.

O. Summary

Clubs using DevTreks can carry out the basic monitoring and evaluation of projects and programs. Clubs can solicit help with projects that are struggling and share structured knowledge explaining success and failure. The net result may be more effective social improvement programs and improved societies.

References

References for M&E analysis can be found in the introductory M&E reference.

References Note

In keeping with the DevTreks ethos (and pocketbook), we try to use references that are open access or that do not charge fees.

Improvements, Errors, and New Features

Please notify DevTreks (devtrekkers@devtreks.gmail) if you find errors in these references. Also please let us know about suggested improvements or recommended new features.

Related DevTreks References (found in the references library at www.devtreks.org)

The *Monitoring and Evaluation 1: Food Nutrition* reference provides an overview of DevTreks' monitoring and evaluation framework.

DevTreks Video Tutorials

A video tutorial explaining monitoring and evaluation analysis in DevTreks can be found at:

<http://devtreks.cloudapp.net/commontreks/preview/commons/resourcepack/Monitoring and Evaluation Analysis 1/476/none>