ARDI Distribution

Visual Data Splitting & Analysis

Overview

Abstract

This document introduces ARDIs Distribution addon and covers some of the cases where it might be used.

Assumed Knowledge

None.

Who to Talk To?

For more information please contact Optrix.

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Introduction

What is Distribution?

The **Distribution** addon is designed to help customers understand how values are distributed across their system. As well as simply showing the raw values across your system, it allows you to *split* those values a number of different ways.

This helps you gain insight into how your various data points perform based on…

- System & Structure
- Other Values / Statuses
- Events
- Time of Day
- Rules

It allows you to analyse both *live* data (ie. the values right now) and *historical* data (ie. the values over the last 24 hours).

Why Would I Need It?

To improve the performance of a system, you need to be able to understand how it works.

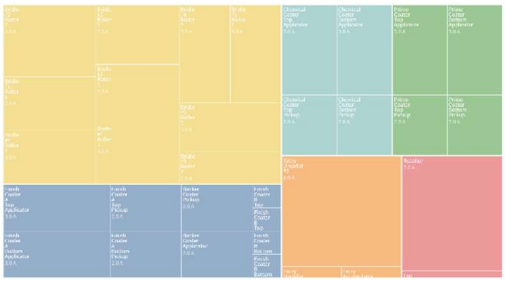
Having access to raw data is extremely useful, but to get insight about how your system is performing under different conditions, you need to be able to *pivot* that data – to see how **parts** of your system your system is performing under **different conditions**.

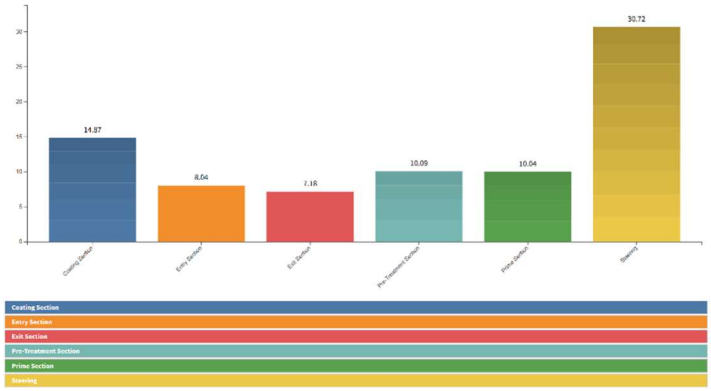
The Distribution addon lets you quickly and easily access this sort of information, both directly through a user-friendly user interface, and as an API for use in applications and scripts.

Use Cases

Splitting By Hierarchy

The most simple way to view your data is splitting it by **hierarchy** – splitting along ARDIs relationships to help you explain which sections of your process are consuming the most power, producing the most product etc.





The examples here show that the **Steering Section** is the part of the process using the largest amount of power, followed by the **Coating Section**.

Users can hover over items for details, and click to dive deeper into that section to see what *parts* of that section are the most active.

Splitting By Time of Day

You can split data based on the time of day that it was recorded.

This is most often used when comparing business/non-business or peak/off-peak times, but can be used for any sort of analysis where you want to compare something *inside* a window of time to a time *outside*.

In the example above, the *total* amount of power being used doesn't change dramatically between inside and outside business hours, but the *distribution* changes significantly.

Distribution

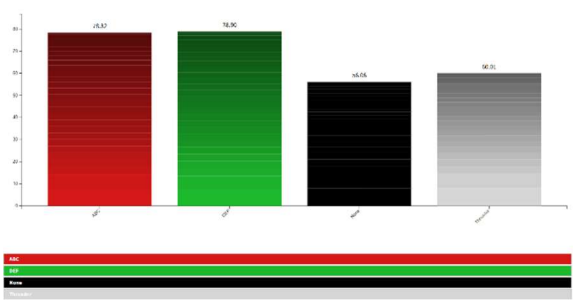
Splitting By Value

Another way to split your data is by **value**. In this case, you can nominate a particular *discrete property* use it to pivot your chosen value.

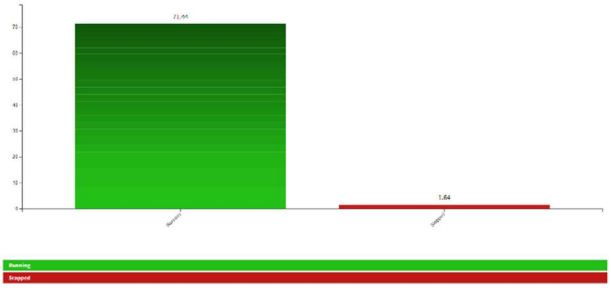
For example, let's say we were trying to compare our energy usage *based on the type of product we're making*.

In this case, **Energy Use** is the measurement we're looking at, pivoted based on…

Product Type:



Running:

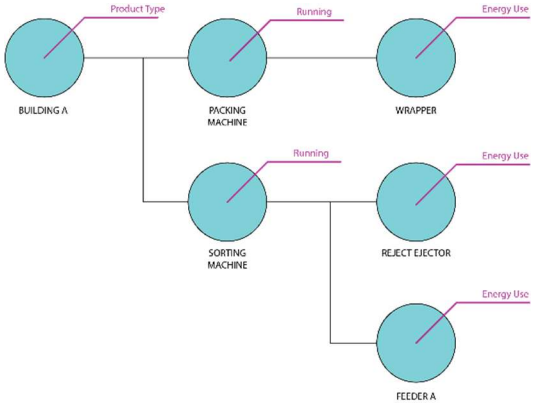


In the left-hand example, we had four different values for Product Type – **None, Threader, ABC** and **DEF**. Product type 'DEF' consumes the most power, but only slightly more than ABC.

As expected, power use is lowest when we aren't making any product – but there might still be room for improvement in turning off equipment when the line isn't in use.

Smart Pivoting

ARDI uses your relationships to help link individual measurement points to pivot points. When a measurement point is found, your relationships are searched to find the nearest asset that has a pivot point value.



In the system to the left, pivoting on **Product Type** will link all energy use to the Product Type on Building A.

But pivoting on **Running** will link the energy use of the W*rapper* with the state of the *Packing Machine*, and the use of the *Reject Ejector* and *Feeder A* will be linked to the running status of the *Sorting Machine*.

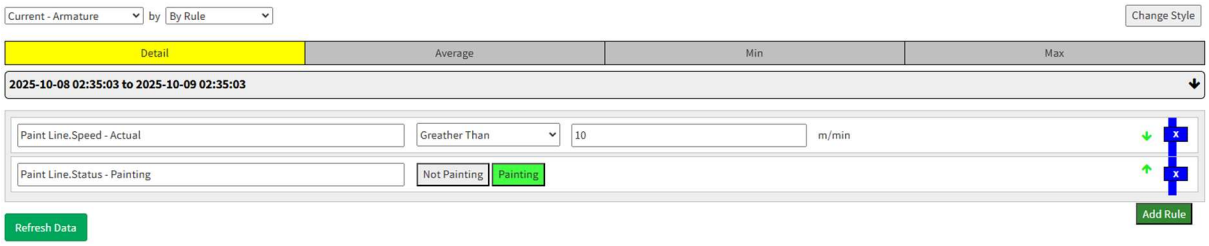
Splitting by Event

If you have a source of *events*, you can split your data across them.

For example, if you have a source of events that represents your *shifts* (ie, morning, afternoon and night shifts), you're able to directly compare figures between those shifts, such as energy usage, wastage, downtime or productivity.

Splitting by User-Specified Rule

You can also specify your own logic. For example, you might want to split your data into times where the machine is both *on* and the speed Is greater than 100m/min.



This allows you to split your data across *analogue* boundaries instead of discrete ones – such as checking to see if a system is more efficient when running slowly vs running fast.