Collecting & Analyzing Your Field Data

Fred Schenkelberg

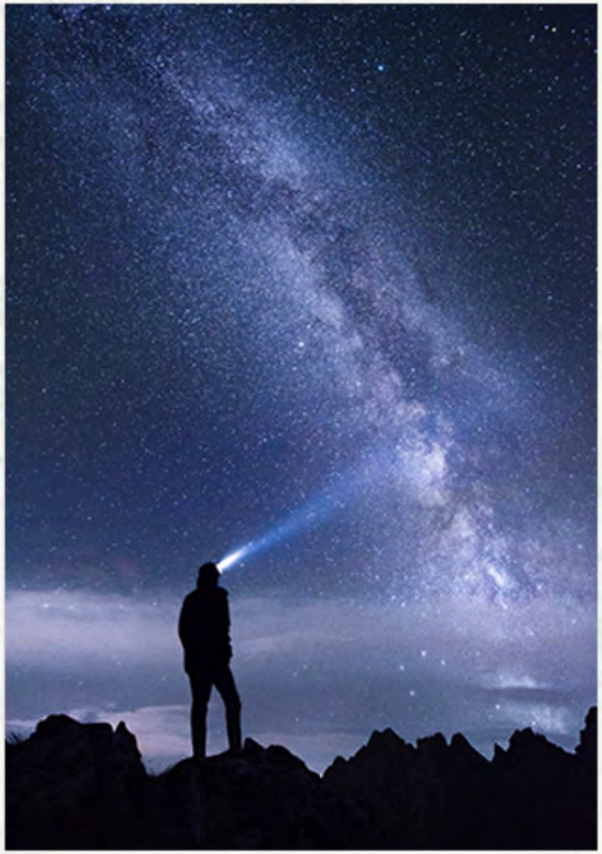
Answer
Questions

Warranty
Accurals

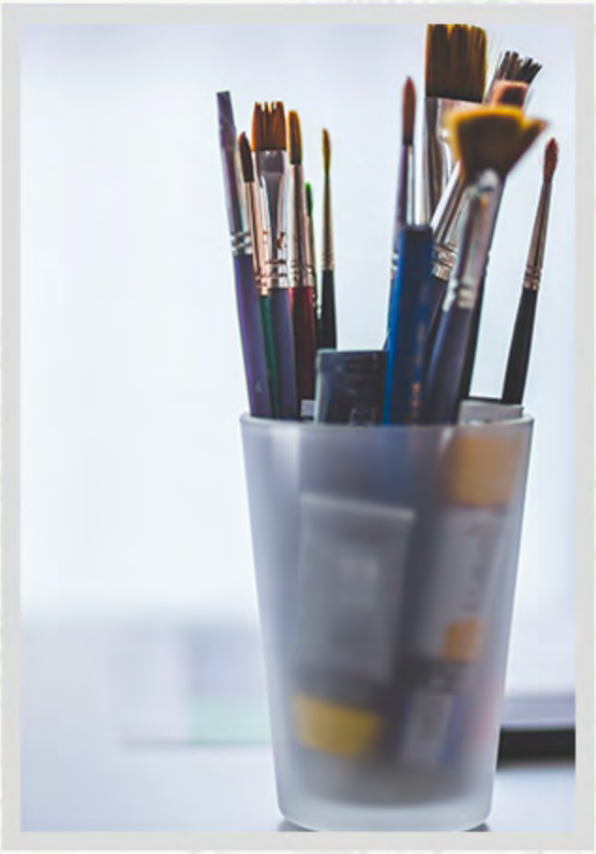
Detect Problems

Where Do You Find Field Data?

Seriously, where can you find data?



What Data?



Be Creative

Problems

What Data Do You Need?

We need perfect data, and rarely will find it.

Ideally:

History of field use
Conditions during use

Time turned on
Time of failure

Failure details

What is the basic minimum data for reliability analysis?

Shipments per month

Failures - linked to shipment month

Let's Find the Data

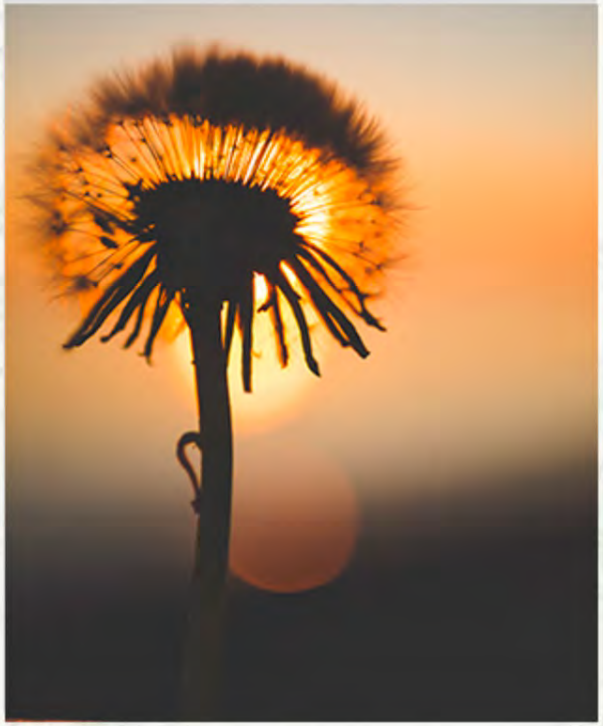
Here you may need to be creative

Brainstorm all the ways the data you need is already of use to others in the organization.

Where could you find data?
Master

Customer Service
Call Centers
Repair/Service Centers
Return authorizations
Replacement shipments
Quality Department

Potential Data Problems



Sure, we'd like perfect data

The data will be messy,

get over it,

and drive on.

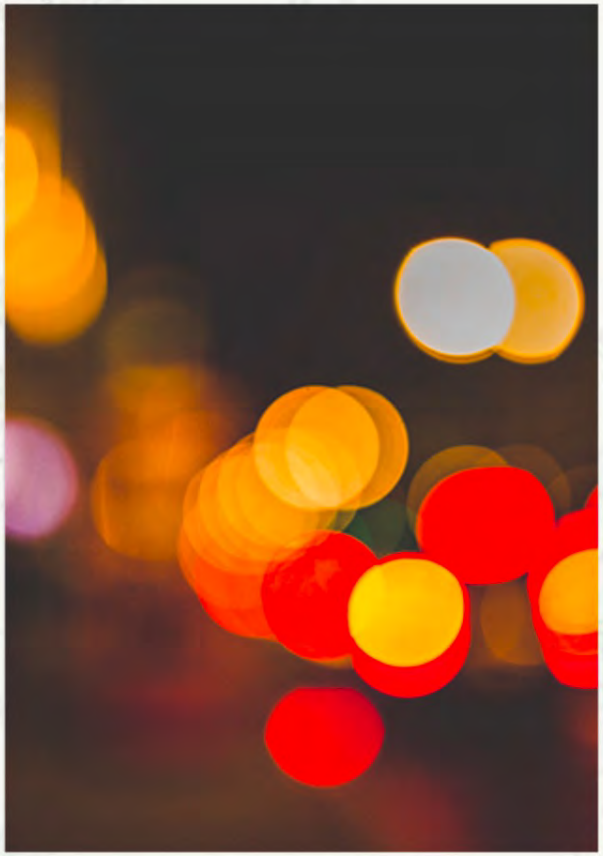
Acknowledge the limitations.

What are examples of data problems?

Not complete
Duplicate or missing entries
Inaccurate entires
Missing retirements
No use conditions

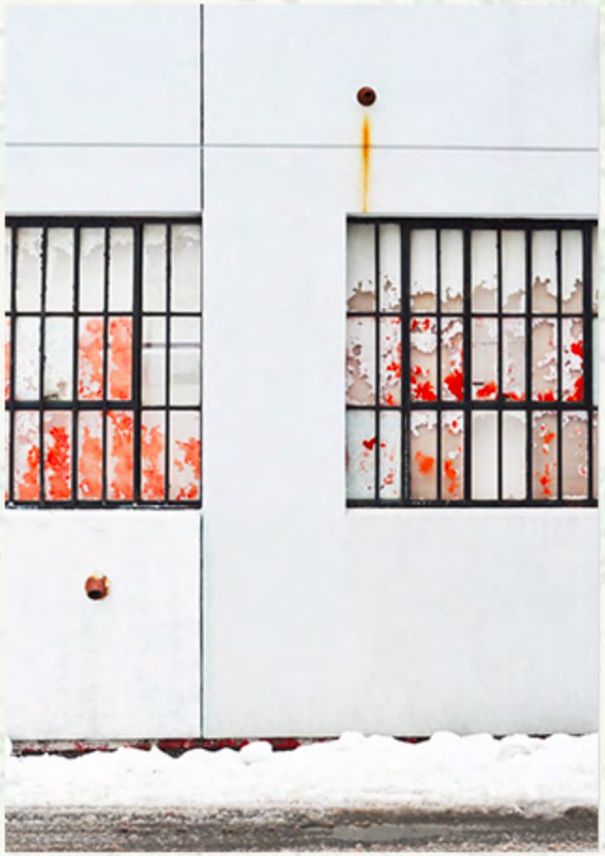
Let's Organize & Analyze

We have data, now organize it



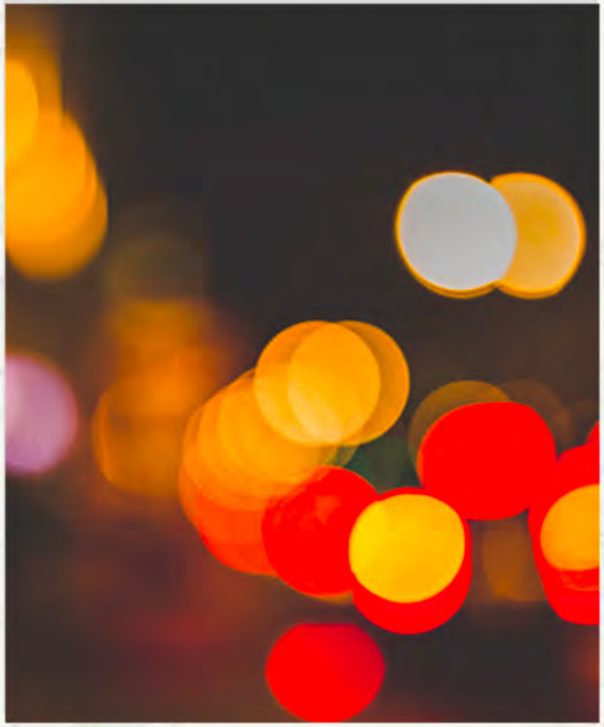
Nevada Chart

Spreadsheet



Patterns

Nevada Chart Collection



Do you know how this chart got it's name?

A simple format to collect the necessary (minimum) data

Shipments
Returns from shipment

Month	Ship	Jan	Feb	Mar	Apr	May	Jun	July
Jan	3,519	3	6	3	7	10	3	
Feb	6,292		4	8	20	35	24	
Mar	7,132			8	14	25	31	
Apr	5,633				4	13	6	
May	4,222					6	8	
Jun	4,476						6	

Speadsheet

We used to do this by hand.

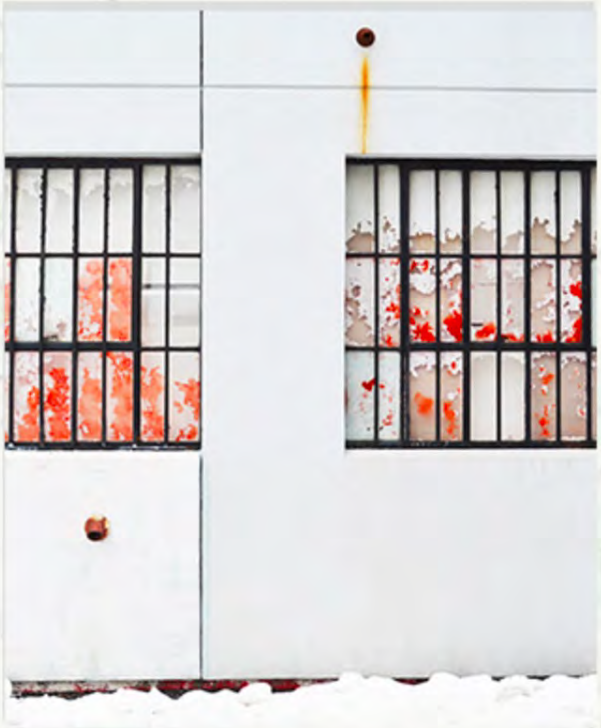
This may test your spreadsheet skills.

Nearly always necessary to arrange the data for your analysis package use.

Suspensions or
Censoring

	A	B	C	D	E
1	Month	shipments	Jan failures	Feb Failures	Mar Failures
2	Jan	3519	3	6	3
3	Feb	6292		4	8
4	Mar	7132			8
5					
6	Number	S or F	Time		
7	3507	S	3		
8	3	F	1		
9	6	F	2		
10	3	F	3		
11	6280	S	2		
12	4	F	1		
13	8				
14	7132-8 = 7124	S	1		
15	8	F	1		

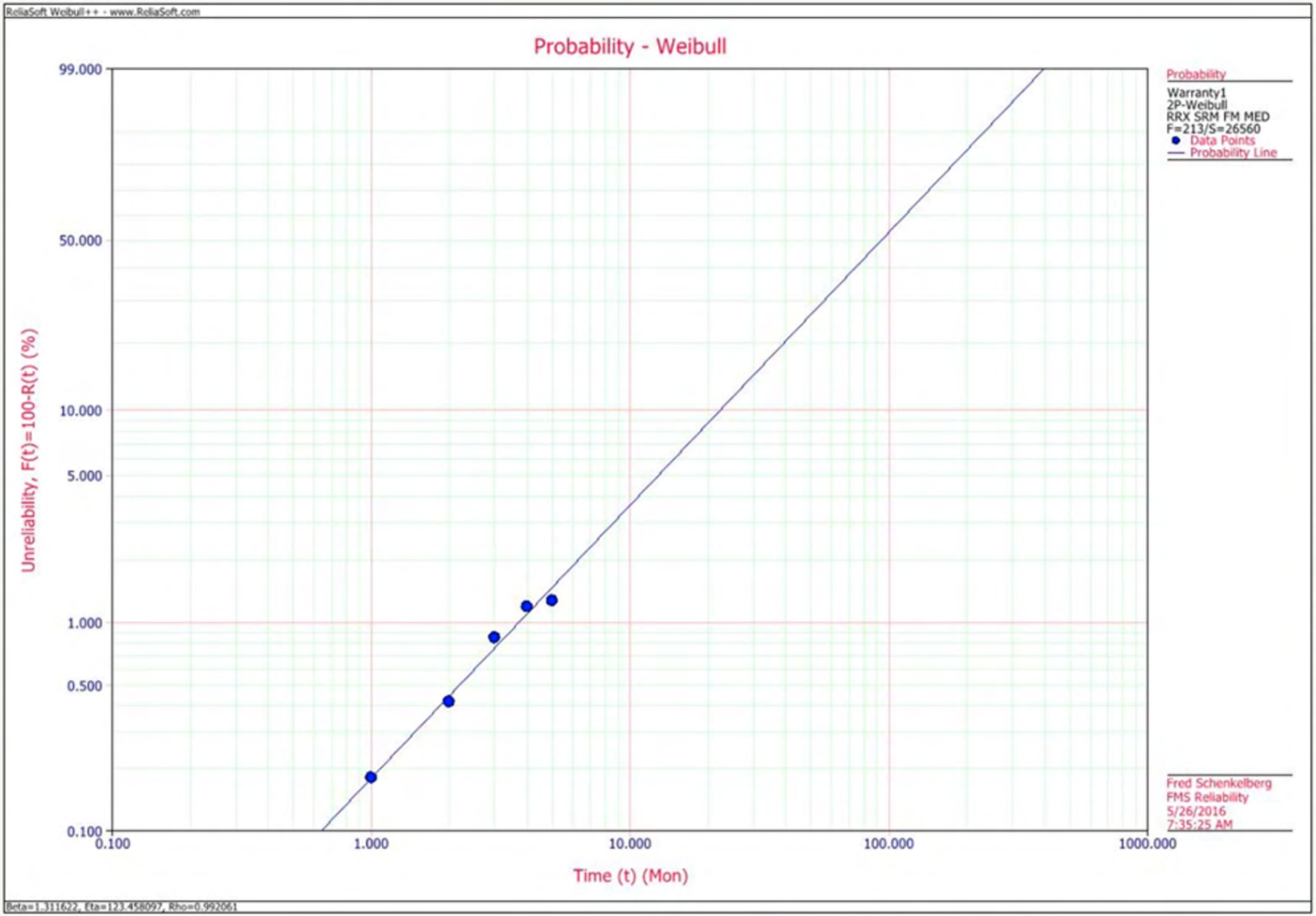
Plotting & Patterns

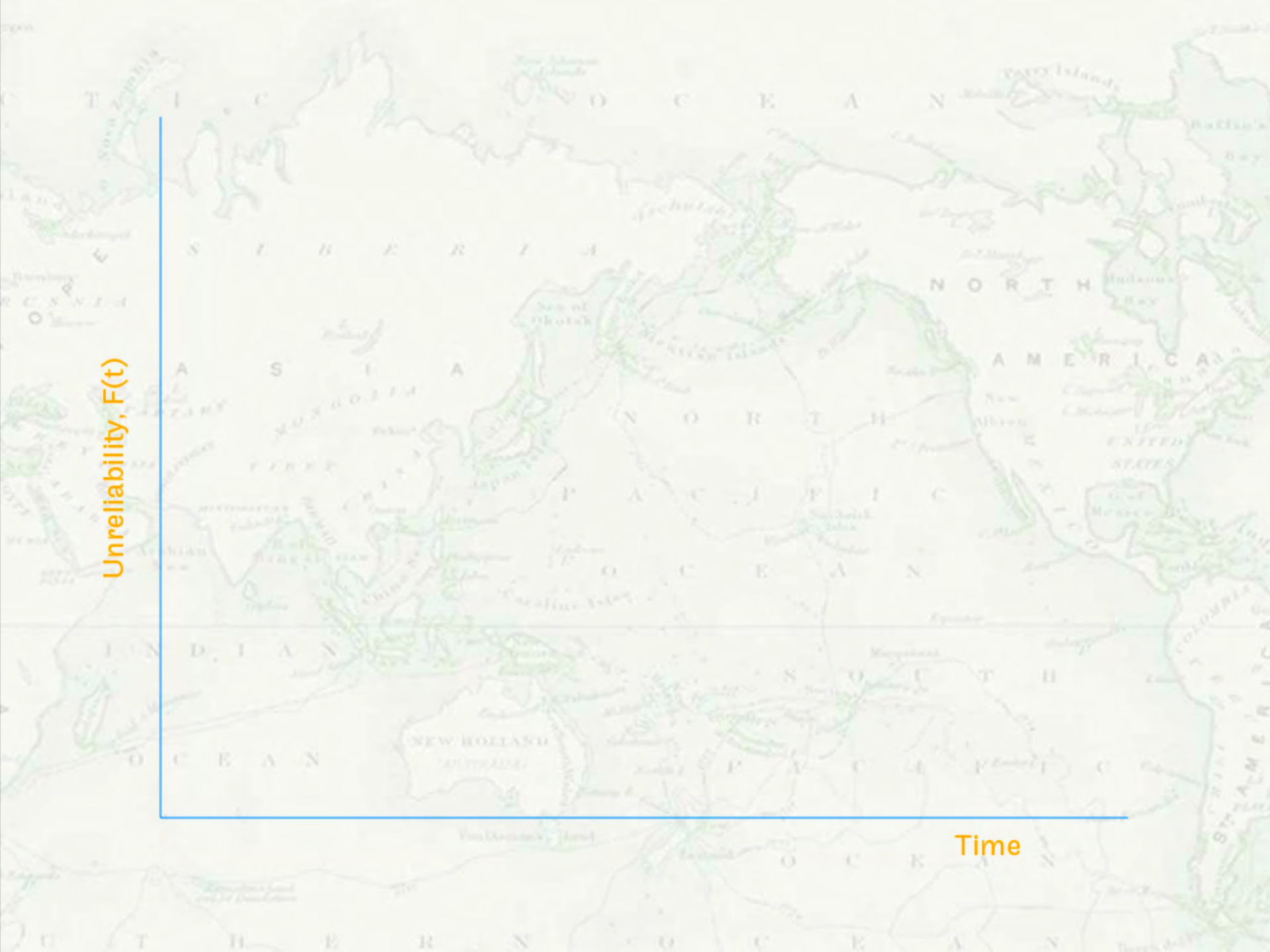


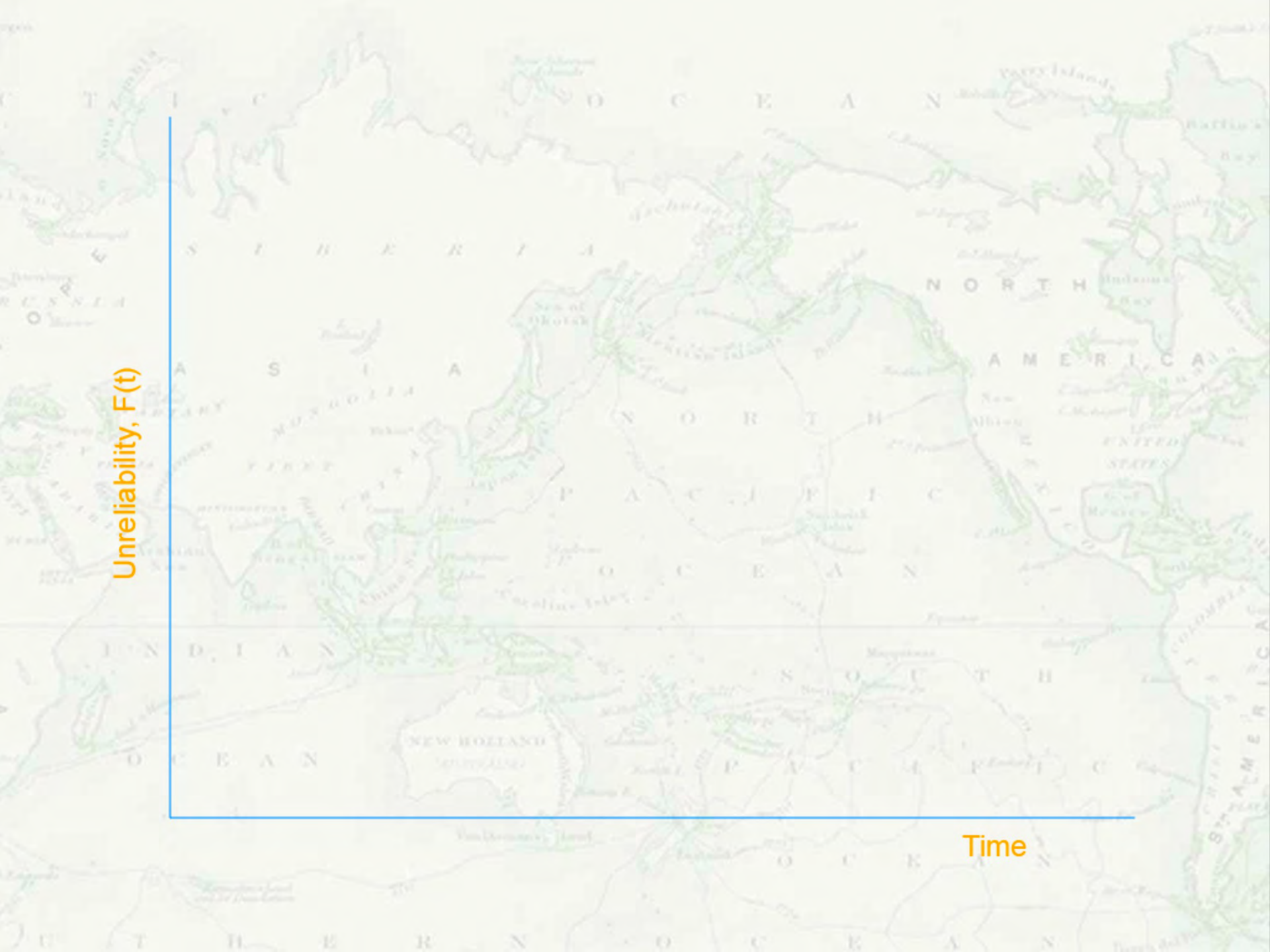
Nearly any data analysis starts with a plot or two

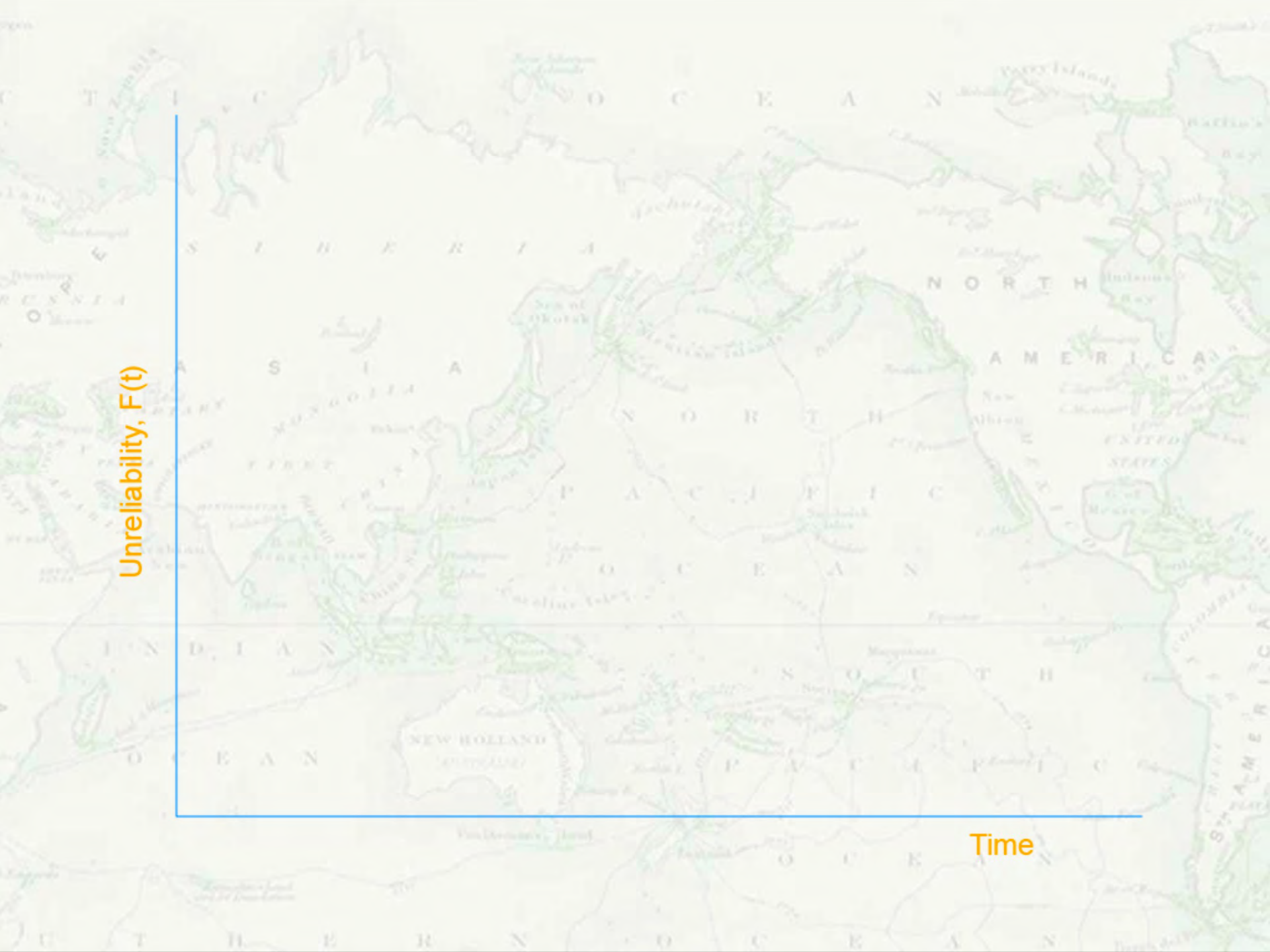
Finally, let's take a look at the data.

The patterns can reveal the next set of questions you should examine.


ReliaSoft Weibull++ - www.ReliaSoft.com
Probability - Weibull
99.000
50.000
10.000
5.000
1.000
0.500
0.100
Unreliability, F(t)=100-R(t) (%)
0.100
1.000
10.000
100.000
1000.000
Time (t) (Mon)
Probability
Warranty1
2P-Weibull
RRX SRM FM MED
F=213/S=26560
Data Points
Probability Line
Fred Schenkelberg
FMS Reliability
5/26/2016
7:35:25 AM
Beta=1.311622, Eta=123.458097, Rho=0.992061


Unreliability, F(t)
Time


Unreliability, F(t)
Time


Unreliability, F(t)
Time

Next Steps

The analysis will lead to better questions.

Improve the data sources

Focus failure analysis

Match estimates to actual

Connect to business objectives

Refine fitted models

Play 'what if' with available information

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