In a nutshell, PATTERNS refer to TIME; TRENDS refer to the SCALE of the deviation.

PATTERNS

1. There's a specific moment in time where the deviation is first observed.
2. The next time an observation was made, there was either a deviation or there wasn't. The next time an observation was made, there was either a deviation or there wasn't. The *next* time an observation was made, there was either a deviation or there wasn't. And so on. (So the Y axis is really "Yes" or "No.")

Paragraph 1 answers the first When question. Paragraph 2 begins to answer the second When question – "When since (the first observation) has the deviation been observed?" Once you have the data for Paragraph 2, you can begin to determine if there's a pattern.

There are four types of patterns:

1. **Continuous** – once you get off Should, every time you make an observation, you're off Should.
2. **One Time Only** – you were off Should that once, and never again.
3. **Sporadic** – Sometimes when you make an observation, you're on Should; other times, you're not. You can't discern or predict when you'll be on Should or not.
4. **Periodic** – Sometimes when you make an observation, you're on Should; other times, you're not. But there is a clear, consistent rhythm to whether or not you're on Should - whether it's time (we're at Should for 28 minutes, we're off Should for 2) or flow (every 99 widgets is fine; the 100th has a deviation).

What's key here is you can predict when you're going to deviate next, and when you'll return to Should next (e.g., at 9:27, we know we're a minute away from going out of spec; if we've run 99, we know the next one will be bad, and then we'll be OK again).

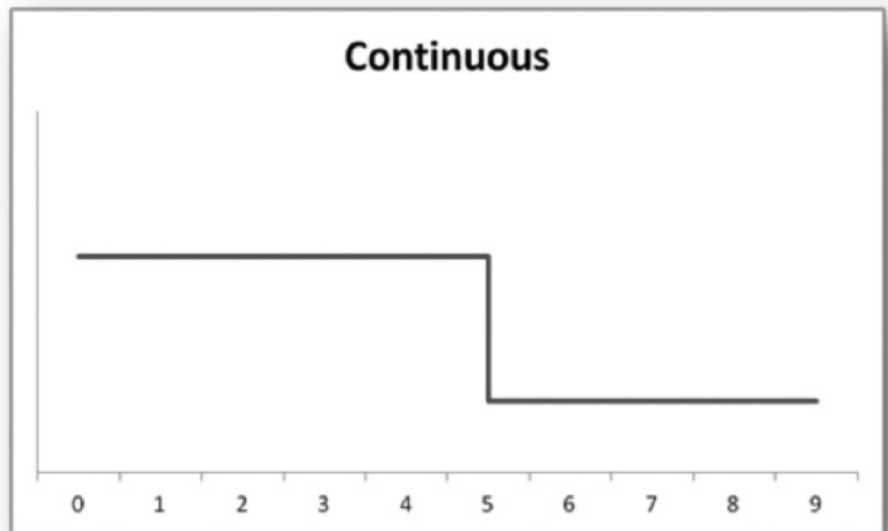Control charts are your friend for getting this data.

But remember, When Since/Patterns are essentially binary – we don't worry about the SIZE of the deviation, just whether or not there IS a deviation.
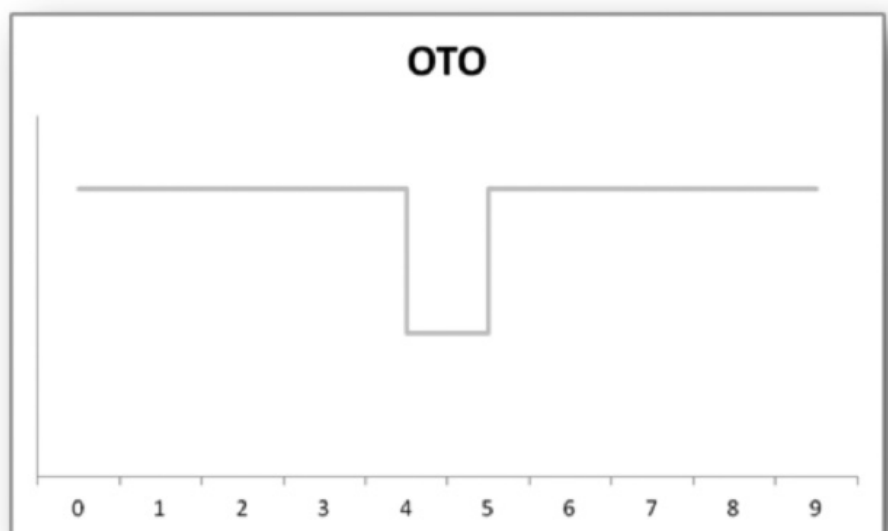
KT Kepner Tregoe

Continuous

Control Chart:

Observation Point	Deviation?
0	N
1	N
2	N
3	N
4	N
5	Y
6	Y
7	Y
8	Y
9	Y

One Time Only

Control Chart:

Observation Point	Deviation?
0	N
1	N
2	N
3	N
4	Y
5	N
6	N
7	N
8	N
9	N

Sporadic

Control Chart:

Observation Point	Deviation?
0	Y
1	N
2	N
3	N
4	Y
5	N
6	Y
7	N
8	N
9	Y
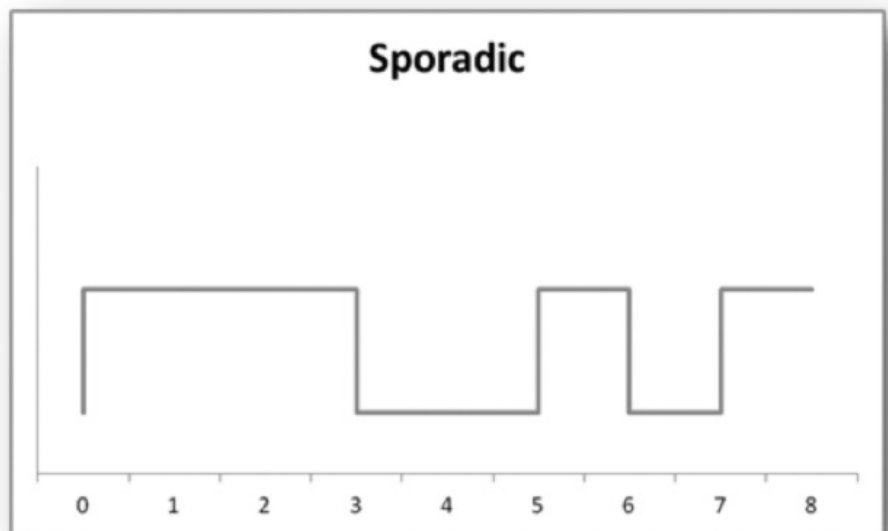
Periodic

Control Chart:

Observation Point	Deviation?
0	Y
1	N
2	N
3	Y
4	N
5	N
6	Y
7	N
8	N
9	Y

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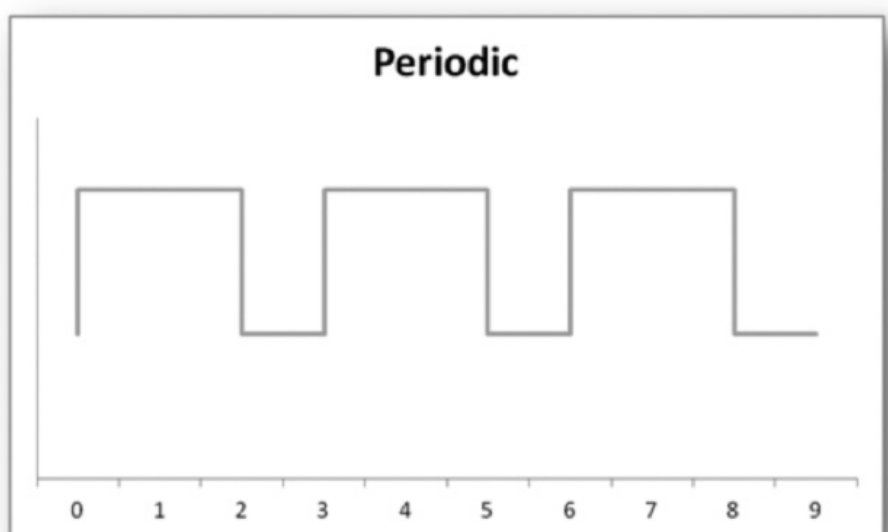
TRENDS

"Trends" are part of "extent" because we're measuring "how much" of something is changing over time; that something can be the change in the object, existence of the deviation, or size of the deviation. In "Patterns" we're looking at whether or not we're seeing a deviation (Closed question); in "Trends" we're qualifying/describing the deviation. (So the Y axis is the "size" or scale of the measurement.)

So if we see a deviation on every observation, it's a "continuous" pattern; if there are more deviations per thousand (DPM) at every observation, then we're also seeing an increasing trend. If the DPM is the same every time we look, it's stable; if the DPM is fewer, it's decreasing.

So here are the same control charts as above. Instead of just "Yes" or "No" for deviation, here is a descriptor of the deviation:

Continuous

Observation Point	Deviation?	SHOULD	ACTUAL
0	N	30	30
1	N	30	30
2	N	30	30
3	N	30	30
4	N	30	30
5	Y	30	**29**
6	Y	30	**28**
7	Y	30	**27**
8	Y	30	**26**
9	Y	30	**25**

So you still have a continuous pattern – once we drop below 30, we're ALWAYS below 30. However, it (whatever "it" is) is decreasing: 29, 28, 27…

Charting the data shows the decreasing trend:

Continuous Pattern, Decreasing Trend
— Should/Actual
— Trend
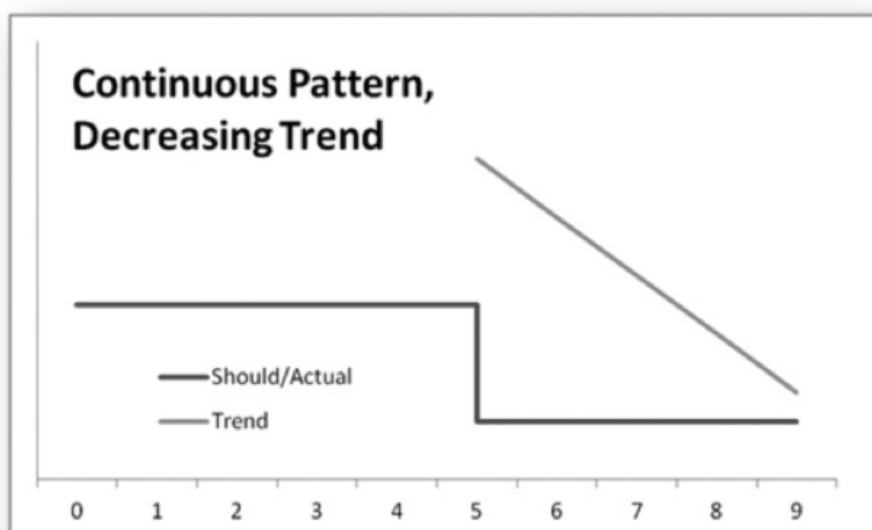
One Time Only

(No trend for one time events.)

Sporadic

Observation Point	Deviation?	SHOULD	ACTUAL
0	Y	30	**27**
1	N	30	*30*
2	N	30	*30*
3	N	30	*30*
4	Y	30	**27**
5	N	30	*30*
6	Y	30	**27**
7	N	30	*30*
8	N	30	*30*
9	Y	30	**27**

I don't know when I'm going to deviate from Should, but I do know something about the deviation itself: it (the size, the number of occurrences, etc.) is always the same. Hence, a stable trend:
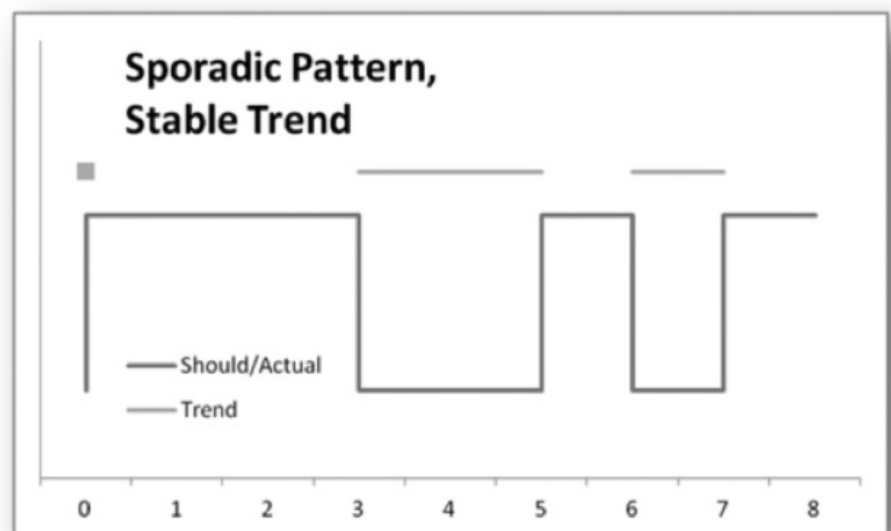
Periodic

Observation Point	Deviation?	SHOULD	ACTUAL
0	Y	30	**31**
1	N	30	*30*
2	N	30	*30*
3	Y	30	**32**
4	N	30	*30*
5	N	30	*30*
6	Y	30	**33**
7	N	30	*30*
8	N	30	*30*
9	Y	30	**34**

I know when I'm going in and out of Should; I also know the trend in my deviation. Here, it's increasing:

For example, in *Microcomputer Cabinets*, we learn that the pattern is "periodic," but we don't know what the period is. After we solve it, we suspect that it's a hybrid – every X (56 or so) cabinets, we deviate; every 30 minutes, we go back to Should. The trend, in this instance, derives from the imbalance between a process that is driven by volume but managed by time. That is, as we run more cabinets each half hour (an increasing trend in the object), we get to that 56th cabinet sooner, so we get more cabinets that have deviations before we get to the 30-minute reset. The trend in occurrence is increasing.
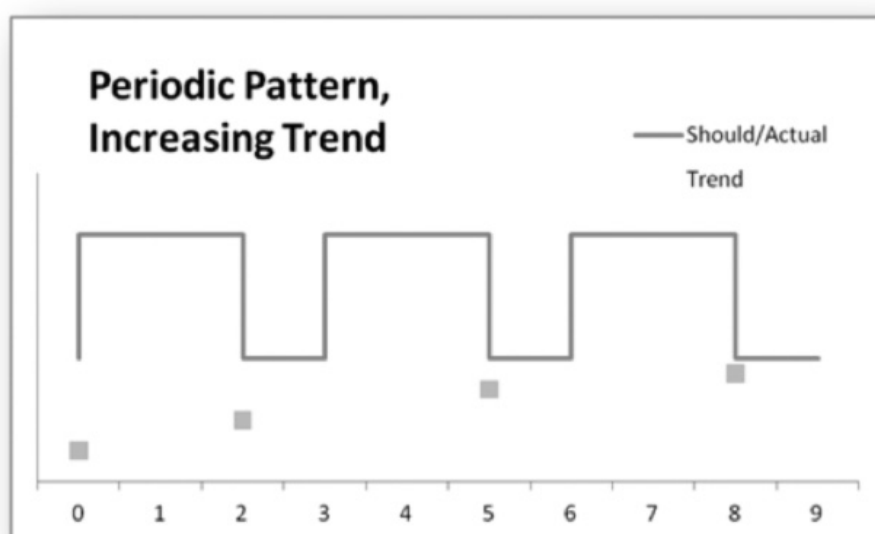
In *Tamworth*, once we receive an observation about foggy film, every observation we have is a deviation; it's a continuous pattern. We're getting more complaints, so the trend in number of occurrences is increasing.

At the end of the day, "patterns" and "trends" measure different dimensions and behave differently (and independently) of each other.