Innovation Lifecycle Stages

How Clustering Reveals Innovation Patterns at Each Stage

ML Clustering Insights Across Lifecycle:

1. Emergence: Detect weak signals and outliers
2. Growth: Identify emerging patterns and segments
3. Maturity: Build comprehensive taxonomies
4. Decline: Spot disruption and transformation

Emergence (2% success)
Growth (10% success)
Maturity (40% success)
Decline/Renewal (20% success)

Sparse
Noisy

Growing
Clustered

Dense
Structured

Fragmented
Mixed

Innovation Funnel

100 Ideas

40 Concepts

15 Prototypes

5 Products

1 Success

Emergence

2%

success

Growth

10%

success

Maturity

40%

success

Decline/Renewal

20%

success

100 ideas

40 ideas

15 ideas

5 ideas

Renewal Cycle

* High uncertainty
* Many variations
* Weak signals

* Pattern formation
* Early adoption
* Rapid iteration

* Clear categories
* Best practices
* Optimization

* Disruption signals
* New combinations
* Transformation

DBSCAN for outliers

K-means for segments

Hierarchical for taxonomy

GMM for transitions

Weak Signals → Pattern Formation → Category Definition → Transformation