



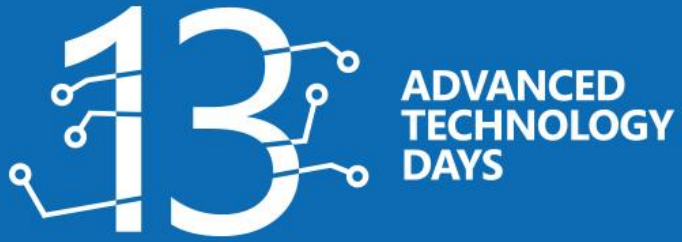
Advanced Technology Days

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Smart Energy Consumption Insights

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Content

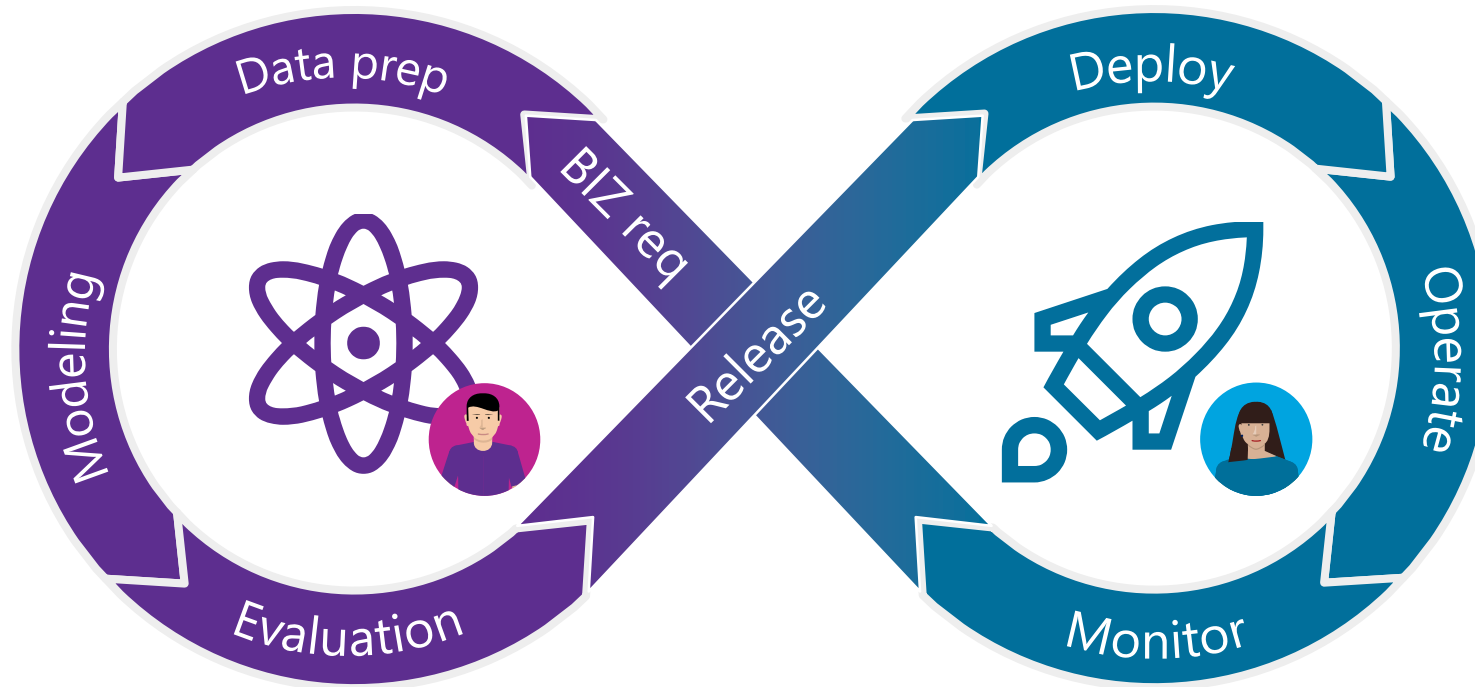
- Intro
- AI Lifecycle
- Azure ML
- Flow & PowerApps
- Data
- Solution architecture
- Demo
- Next steps
- Let's crunch the numbers

“ The science of today is the technology of tomorrow. ”

Edward Teller



AI Lifecycle



Azure Machine Learning



Studio

- collaborative, drag-and-drop tool
- build, test and deploy predictive analytics solutions

Services

- ML at Big Data scale
- Container based AI deployment
- Spark, Docker, TensorFlow

DS VMs

- Pre-configured environments
- Seamless integration with Azure services
- Support for GPUs and popular DNN

Flow & PowerApps



Microsoft Flow



PowerApps

Data

UK household data insights

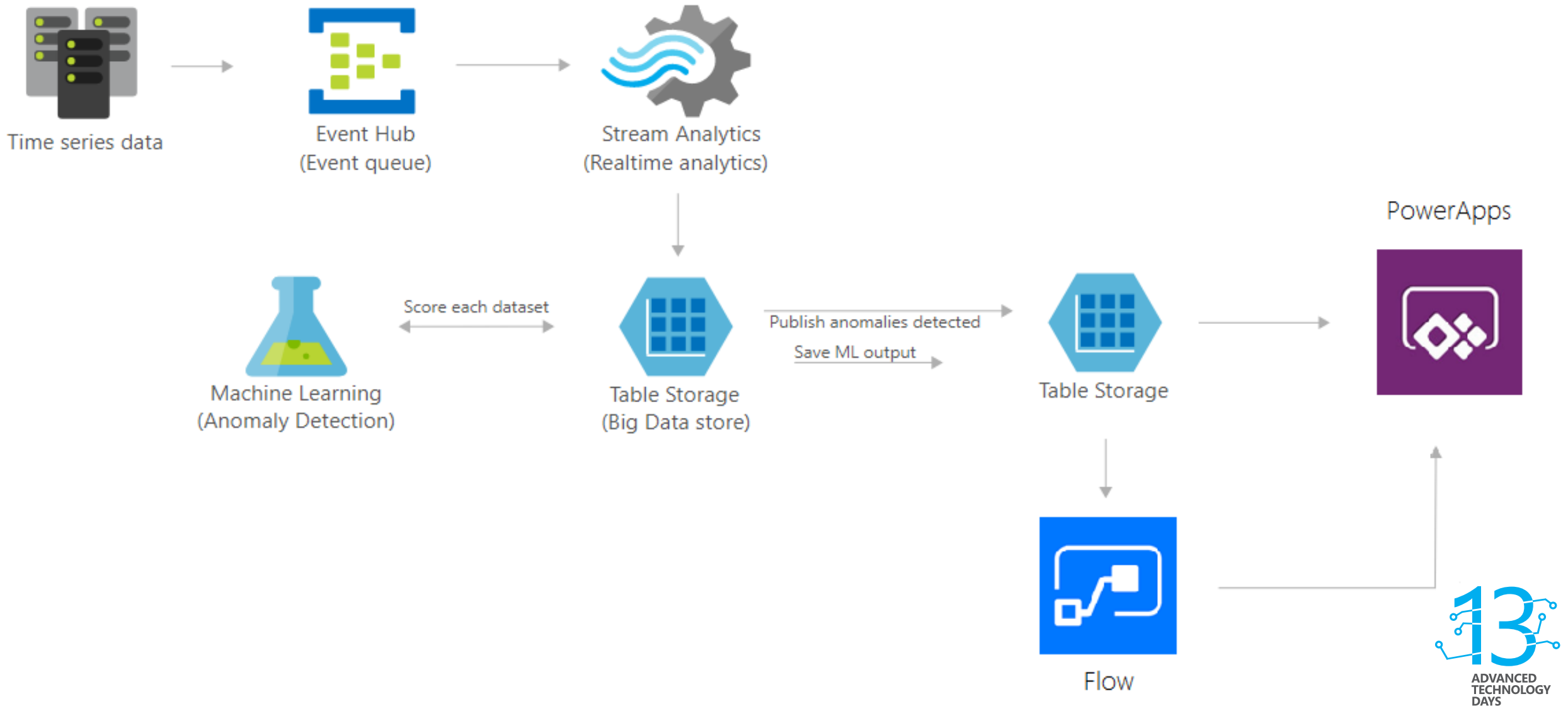
- 10 power sensors - household aggregate and individual appliance monitors
- Active power in Watts
- Source: University of Strathclyde, Glasgow

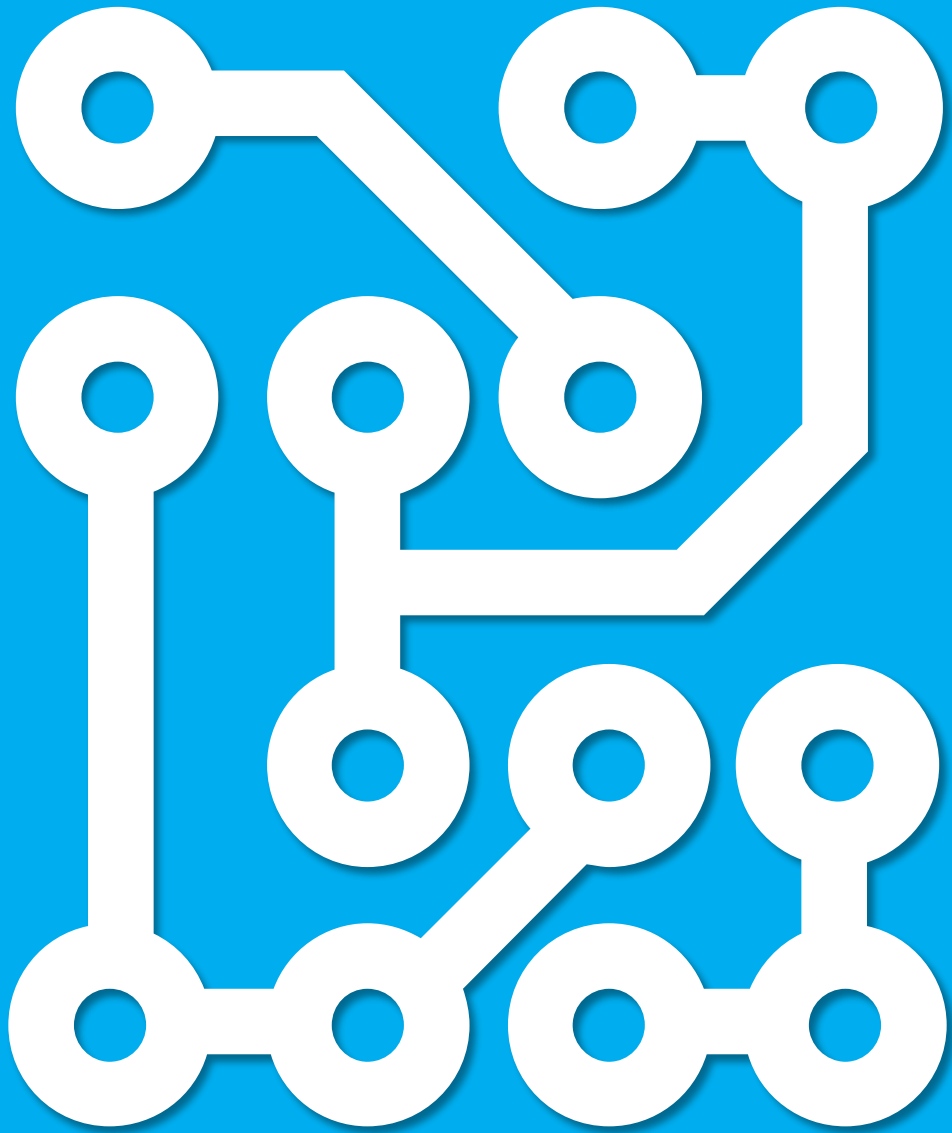


Appliance	Product	Supplier	Model	Note
0	Aggregate	-	-	-
1	Fridge	Neff	K1514X0GB/31	-
2	Freezer	Ocean	UF 1025	-
3	Fridge-Freezer	Ariston	DF230	(change Aug 17 2014)
4	Washing Machine(1)	Servis	6065	-
5	Washing Machine(2)	Zanussi	Z917	-
6	Desktop Computer	Unknown	Unknown	-
7	Television Site	Sony	KDL-32W706B	(change at 19 Dec 2014)
8	Microwave	Matsui	170TC	-
9	Kettle	Swan	Unknown	-

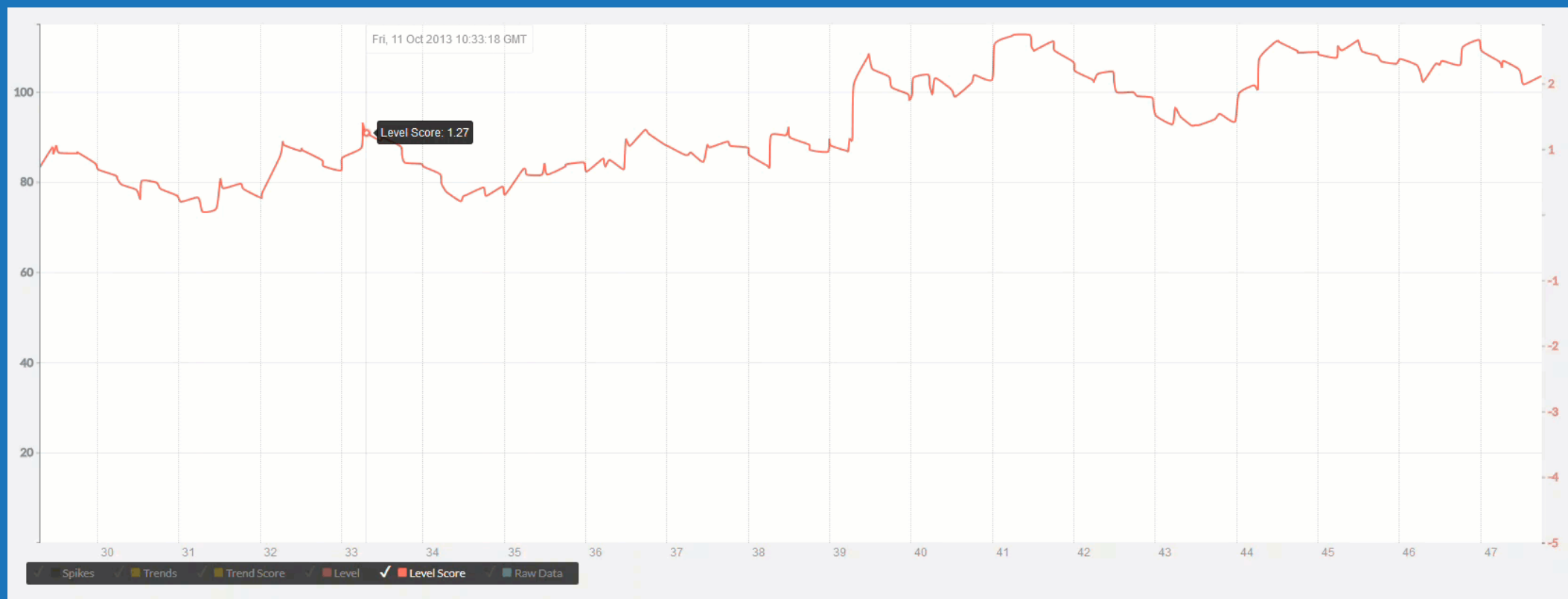
Household info	Data
Occupancy	2
Construction year	1850-1899
Appliances owned	33
Type	Detached
Size	4 bed

Solution architecture





DEMO



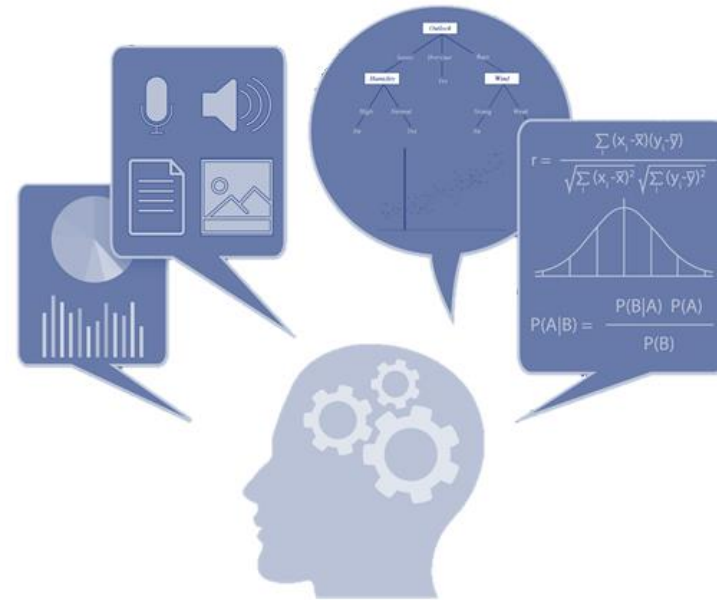
Why is it useful?



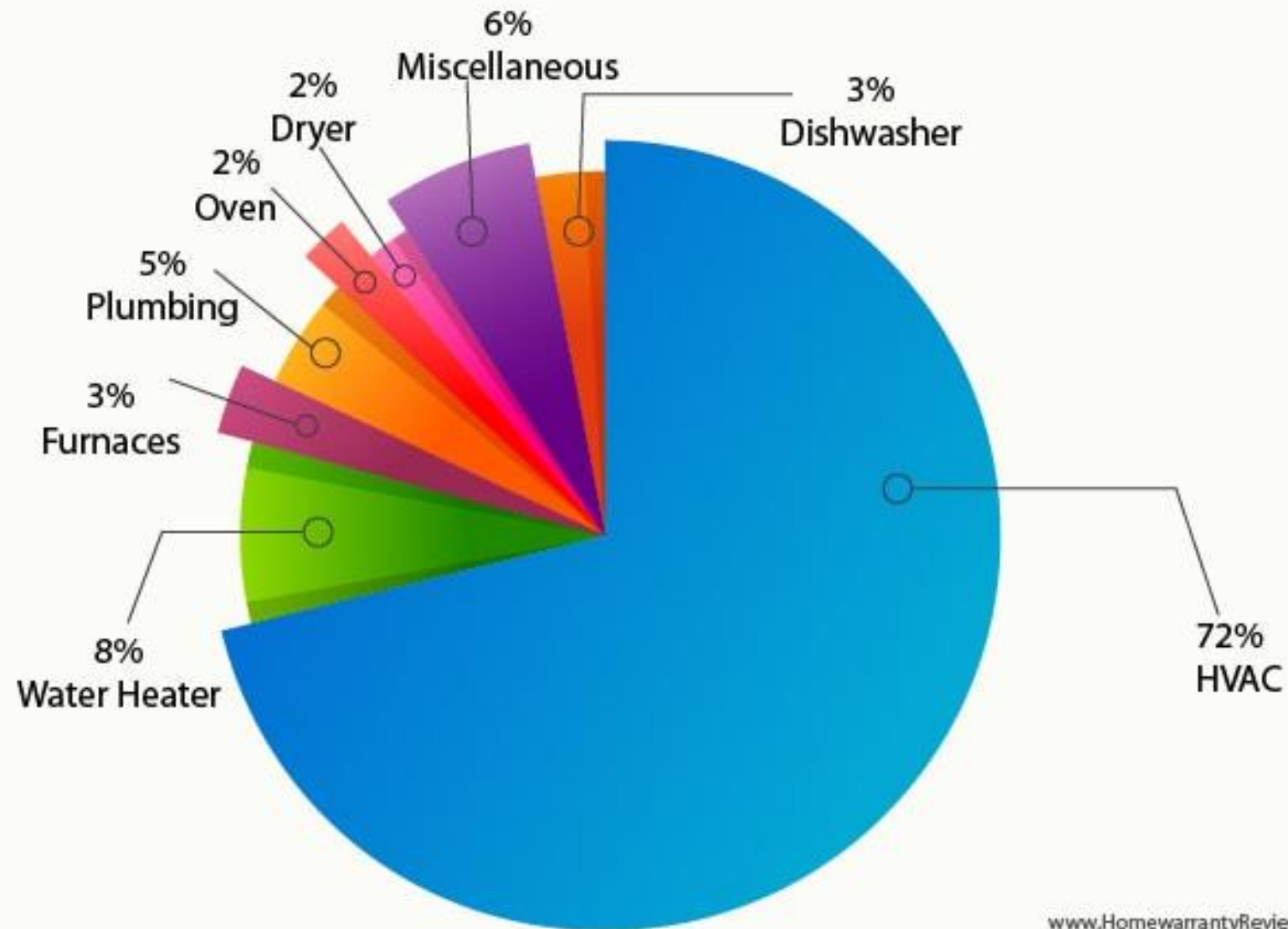
- Proactive management of power resources
- Preventive and predictive maintenance
- Reliability-based monitoring approach
- Early detection of problems

Further steps

- Include One-class SVM, PCA (label data)
- HVAC system → real smart house
- Predicting future electricity consumption and bills
- Average lifespan of appliances



Which Appliances Break Most Often?



www.HomeWarrantyReviews.Com

Let's crunch the numbers

25%

Of final energy consumption of households in EU 2015 is electrical energy

~45%

Electric cars are coming

76

Average appliance number in household

3370kWh

Global average per home in year

\$50~70

Average dishwasher repair cost

50%

Lifespan rule

8

Group of basic IoT home sensors

40.9B

Active wireless devices in 2020



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