INSIDE THE RENT ZESTIMATES

UseR! 2016
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Flipping Houses

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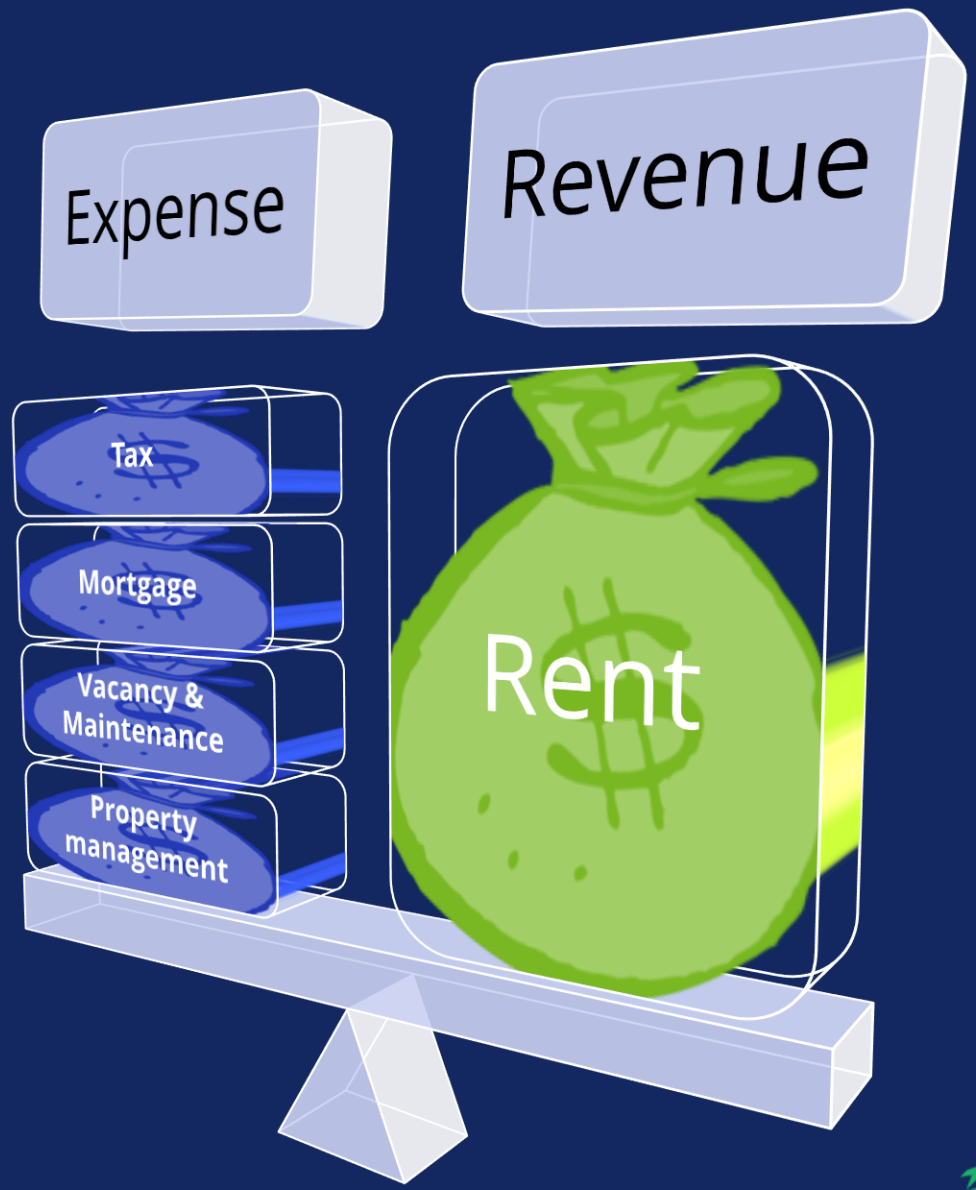
Land load



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What is the rental price?

An Iterative Method

Percent higher than Rent Zestimate	Result
0%	• 3 applications on the first day of listing
5%	• 2 applications within 2 weeks
10%	• 1 application within 5 weeks
7%	• 1 application within 3 weeks

Rental Price

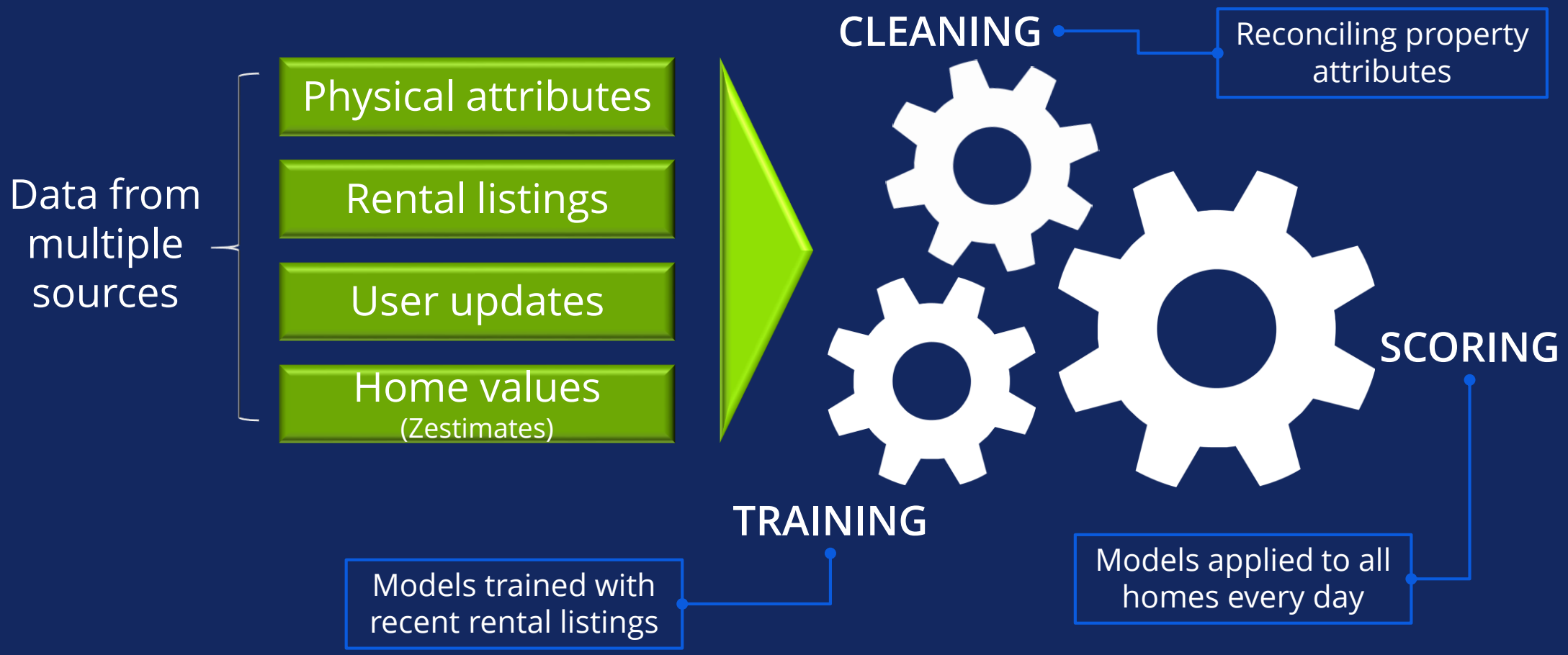
My Rental Estimate = $rz[t] * (1 + \varepsilon)$

Where $rz[t]$ is Rental Zestimate for a property at time t

and $|\varepsilon| << 1$

EX: ε = median(0.05, 0.10, 0.07) = 0.07

Rent Zestimate Engine



RENT ZESTIMATE:	Value:	Range:
	$1,450/mo	$1,300 - $1,600K

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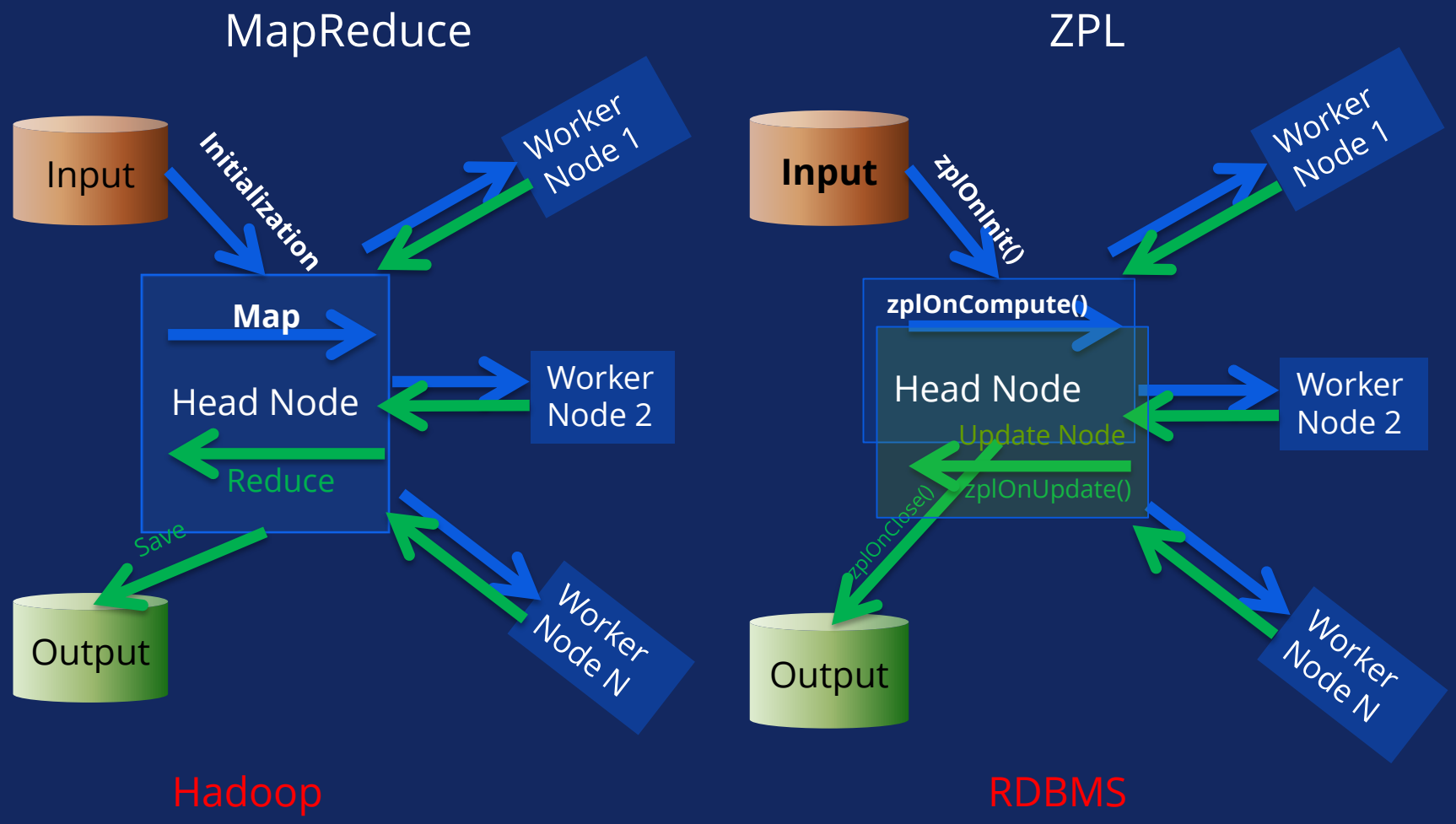
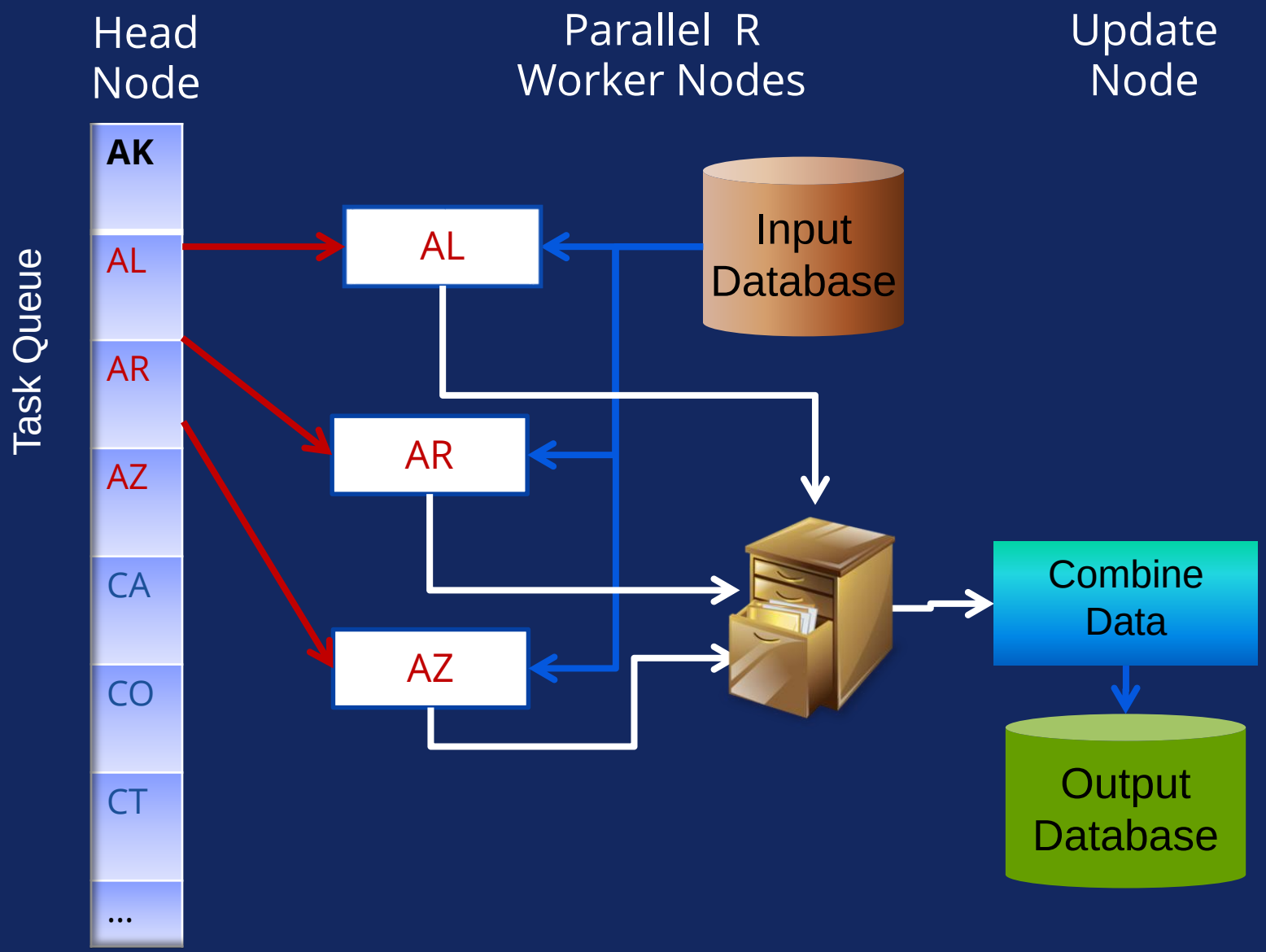
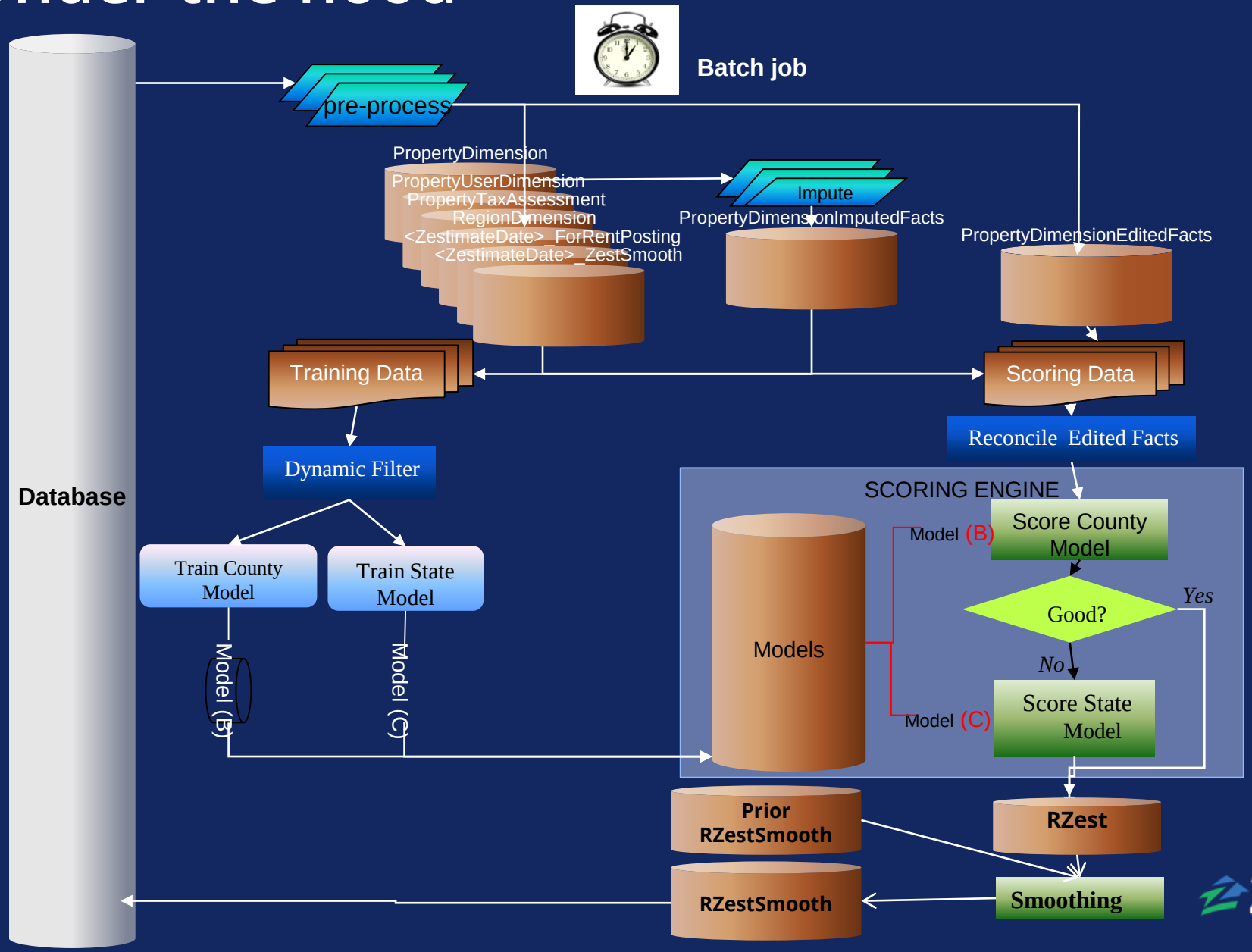
Map Reduce vs. Zillow Parallel Library (ZPL) for R



Data Partitioning and Parallel Computing



Under the hood



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Accuracy Measurement

Hold-out 30% of training data

If **rz** are the Rent Zestimates for homes in the hold-out dataset, then the percent estimated errors are

e =100***(rz – r)/r ,**

where ***r*** are the actual rental listing prices.

Key metrics :

Median (|**e**|)

Percent of Rent Zestimates within *x*% of rent price

$$\frac{100}{\mathrm{N}} \sum_{i=1}^{\mathrm{N}} (\, |e_i| < x \,),$$

where *x*% : 5%, 10% and 20% and N is number properties in the hold-out set

Commit to transparency

http://www.zillow.com/howto/DataCoverageRentZestimateAccuracy.htm

Data Coverage and Rent Zestimate Accuracy Table

Choose a location type below to change data:

Top Metro Areas
States/Counties*
National

	Rent Zestimate Accuracy	Homes on Zillow	Homes with Rent Zestimates	Within 5% of Rent Price	Within 10% of Rent Price	Within 20% of Rent Price	Median Error
Portland, OR	★★★	812.4K	783.1K	35.7%	60.5%	82.5%	7.4%
Riverside, CA	★★★★	1.6M	1.3M	39.3%	64.0%	83.4%	7.0%
Sacramento, CA	★★★★	791.0K	708.9K	39.6%	65.7%	86.8%	6.5%
San Antonio, TX	★★★★	827.7K	746.3K	40.2%	64.4%	85.3%	6.8%
San Diego, CA	★★★	906.1K	874.4K	35.0%	58.4%	80.8%	7.9%
San Francisco, CA	★★	1.3M	1.3M	31.0%	55.2%	78.2%	8.7%
Seattle, WA	★★★	1.3M	1.2M	34.0%	58.4%	83.2%	8.1%
St. Louis, MO	★★★	1.2M	1.1M	33.7%	56.1%	82.5%	8.3%
Tampa, FL	★★★★	1.3M	1.2M	39.3%	63.3%	85.9%	7.0%
Washington, DC	★★★★	1.9M	1.9M	42.4%	67.7%	87.7%	6.2%

Definitions

ZESTIMATE ACCURACY/STAR RATING:

This rating is tied to the Median Error in an area.
The ratings are as follows:

★★★★ = Best Rent Zestimate
★★★ = Good Rent Zestimate
★★ = Fair Rent Zestimate
★ = Unable to compute Rent Zestimate accuracy
0 stars = No valuation

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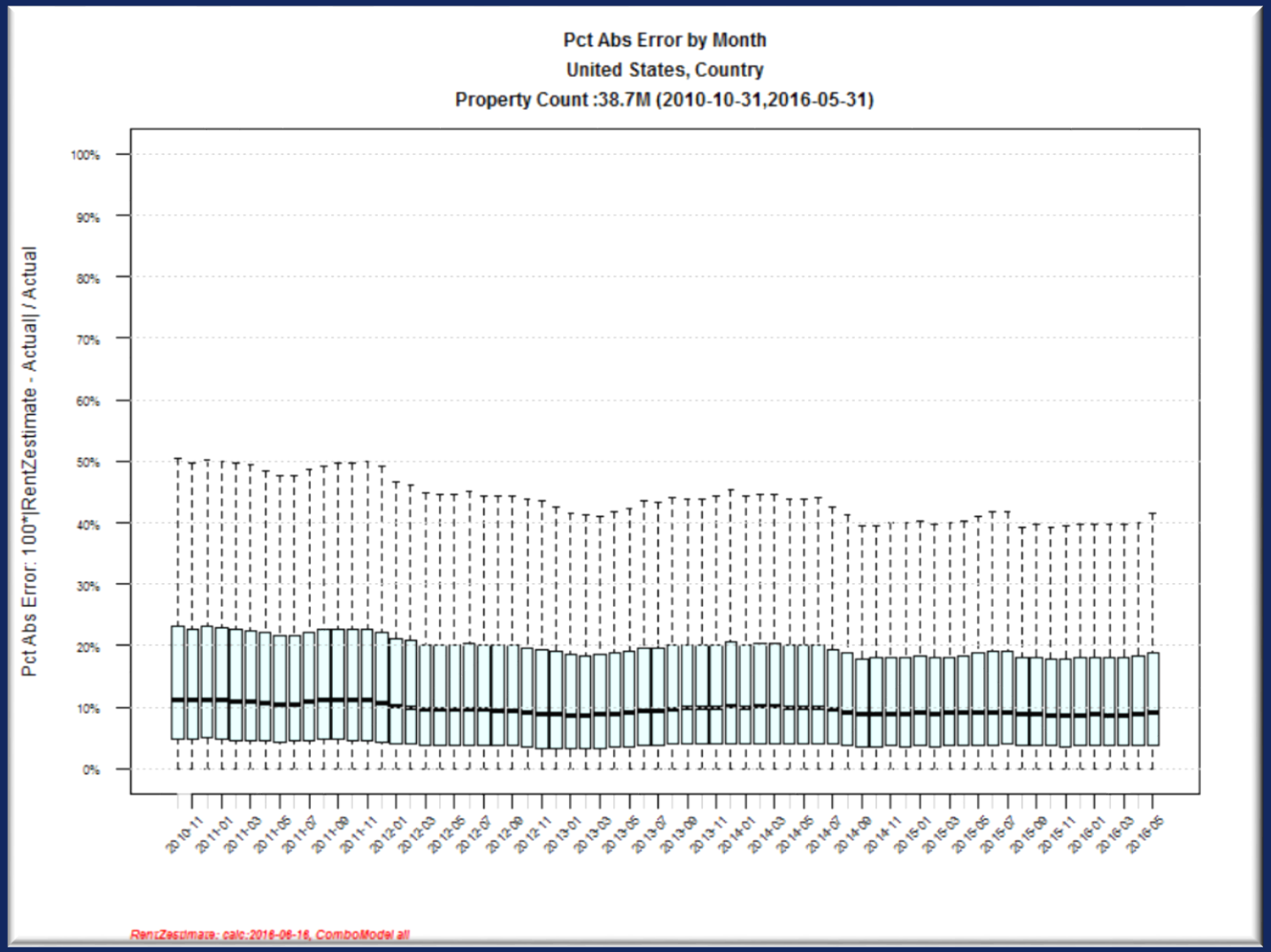
Monthly Accuracy: box plot of |Pct Error| by month



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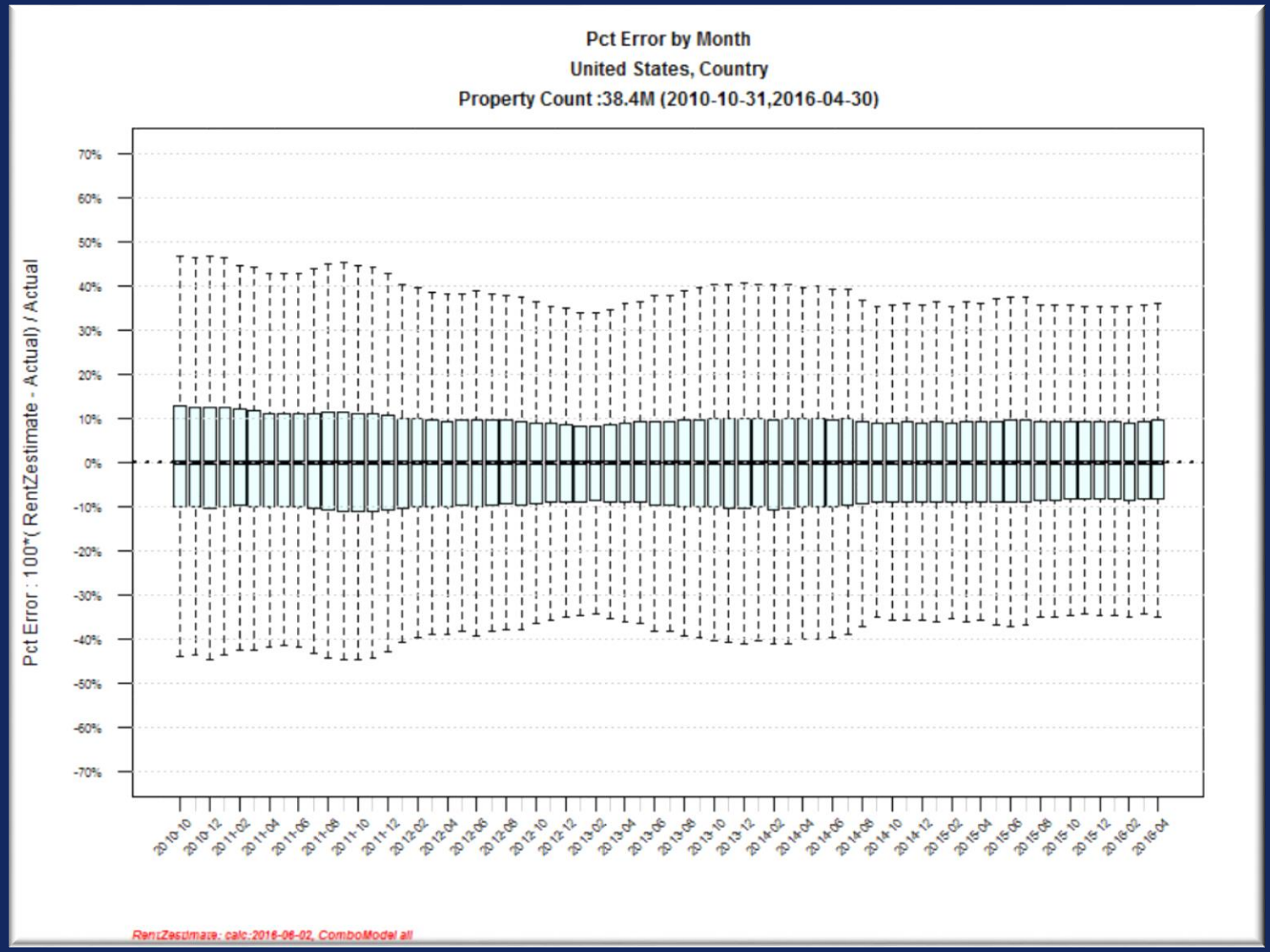
Systematic Error : box plot of Pct Error by month



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Key Takeaways

- **Rent Zestimate**
  - A starting point in determining the monthly rental price for a specific property.
  - Best tool for landlords, tenants, investors,...
- **Serious production software in R ?**
  - Yes

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