

REAL-TIME RECOMMENDATIONS IN A MULTI-DOMAIN ENVIRONMENT

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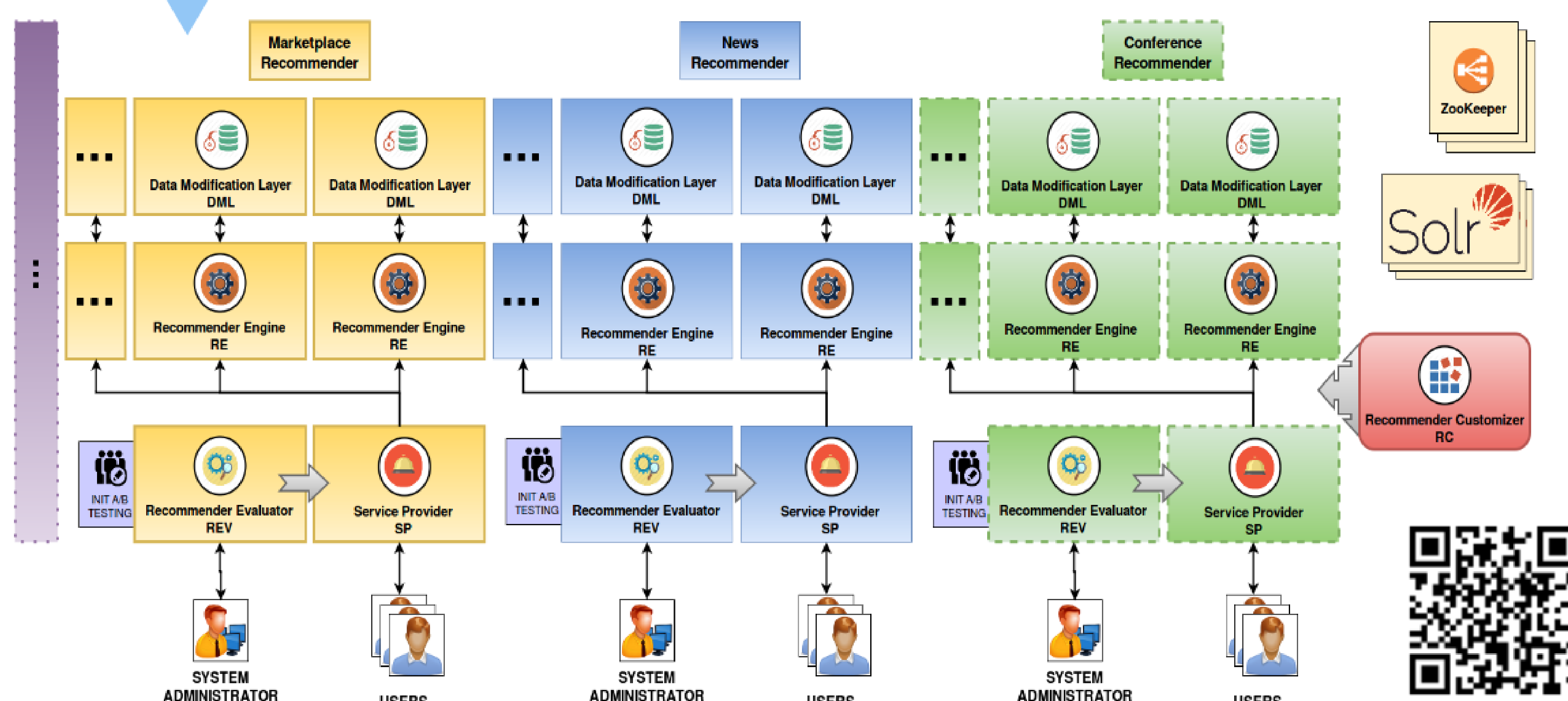
MOTIVATION & APPROACH



		Products			Low-level categories			Top-level categories					
	Sets		$nDCG@10$	$P@10$	$R@10$	$nDCG@10$	$P@10$	$R@10$	$nDCG@10$	$P@10$	$R@10$	$D@10$	UC
		Most Popular	.0082	.0021	.0122	.0185	.0207	.0157	.2380	.2730	.2221	.5945	100.00%
Weighted Sum	Market	Content	.0151	.0103	.0142	.1051	.0886	.1046	.5232	.4476	.5210	.6421	99.79%
		Content	.0030	.0019	.0025	.0702	.0432	.0571	.5555	.3274	.4523	.5603	81.65%
	Social	Network	.1416	.1180	.1450	.2454*	.1416	.1740	.5708	.3385	.4047	.4591	71.53%
		Combined	.1418	.1165	.1454	.2104	.1515	.1942	.5901	.4131	.5446	.6245	92.70%
	Location	Content	.0036	.0021	.0030	.0556	.0406	.0556	.5535	.3870	.5535	.6923	100.00%
		Network	.0015	.0007	.0010	.0535	.0284	.0378	.5359	.2672	.3783	.4864	70.59%
		Combined	.0036	.0022	.0031	.0540	.0406	.0540	.5497	.3832	.5497	.6914	100.00%
	Combined		.1460*	.1187*	.1493*	.2163	.1708	.2159	.5978*	.4656	.5965*	.6642	100.00%
	Combined Top 3		.1459	.1186	.1475	.2161	.1801*	.2161*	.5829	.4898*	.5829	.6530	100.00%

UTILIZE DIFFERENT DATA SOURCES

FRAMEWORK FOR A MULTI-DOMAIN ENVIRONMENT



REQUIREMENTS

To support real-time recommendations in multiple domains it is needed to:

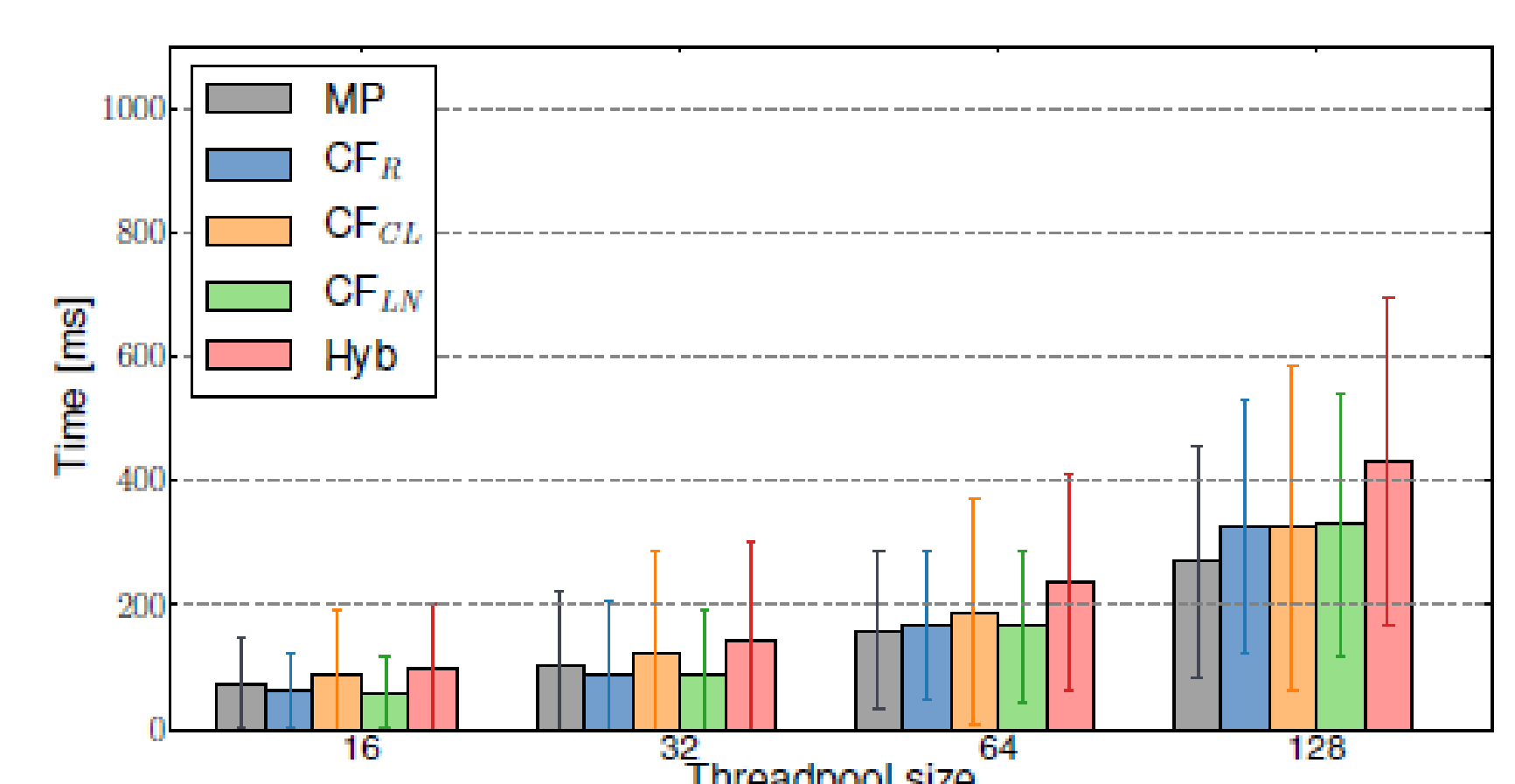
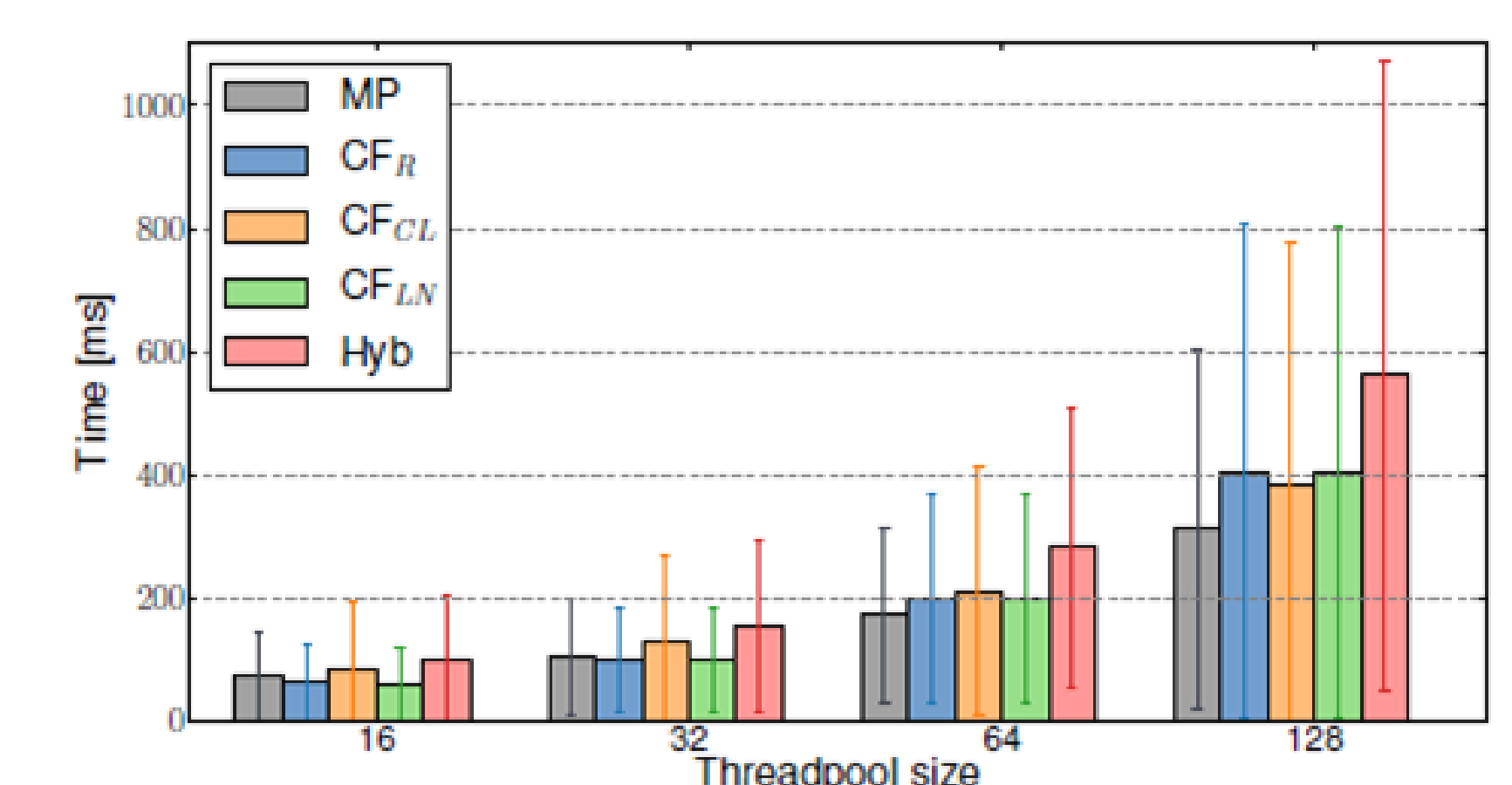
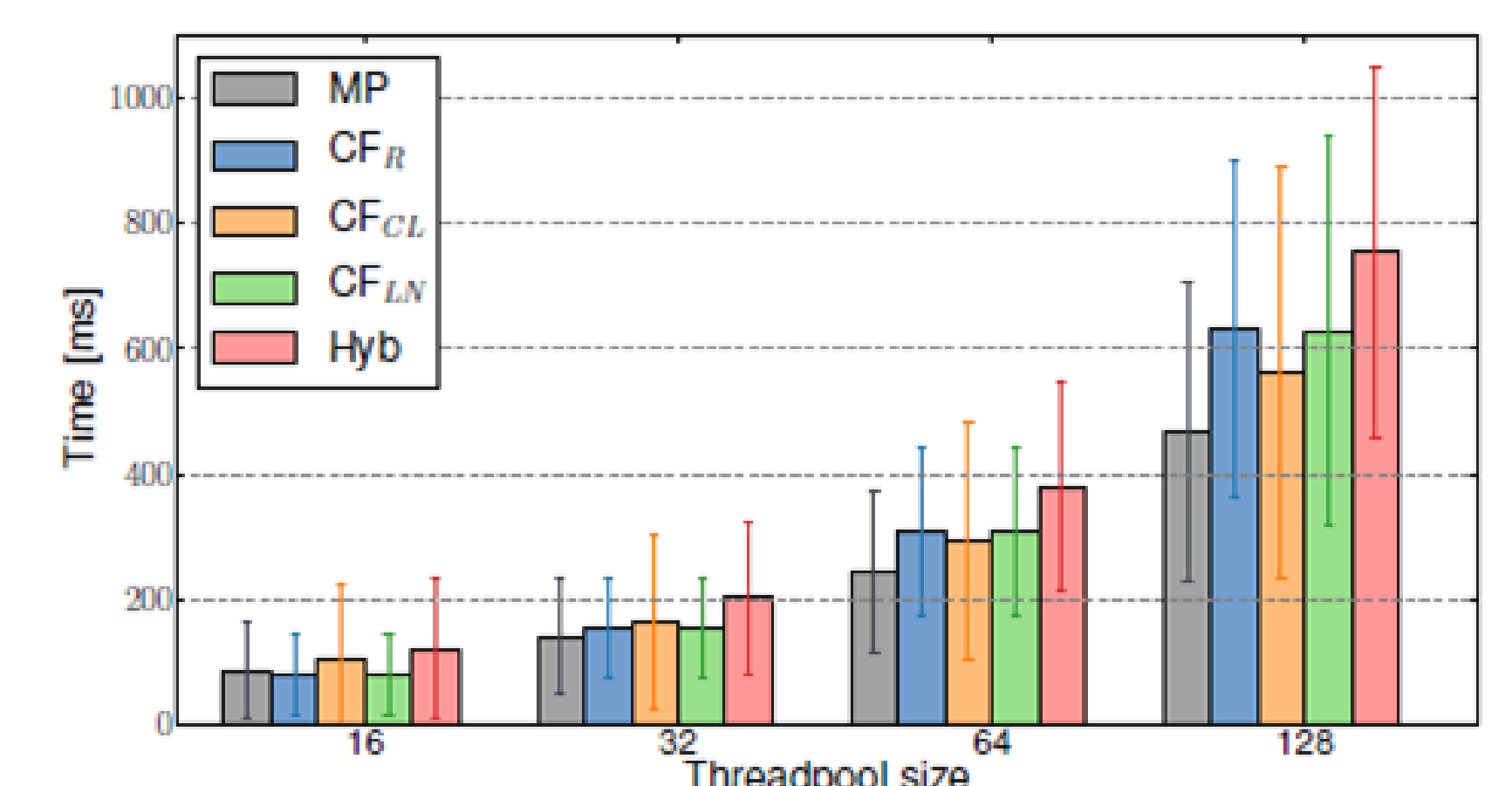
1. Process **streaming data online** while providing real-time recommendations
2. Support a **multi-domain environment** and the corresponding **data features**
3. Provide a **scalable architecture** to cope with increasing request loads
4. Be able to **customize** domain specific models and approaches

SCALABILITY EXPERIMENT

Foursquare dataset:

#Items	1,143,092	#Users	2,153,471
#Ratings	2,809,581	#Check - Ins	1,021,970

- Task:
 - 325,005 independent recommendation requests to process
- Load simulation:
 - A threadpool which simultaneously requests recommendations
- Scenarios:
 - a) 1 local processing node
 - b) 2 distributed nodes
 - c) 4 distributed nodes



FW & REFERENCE

Investigate the **recency** of history data and candidate recommendations to **balance** the trade-off between **accuracy** and **runtime**.

- [1] E. Lacic. Real-Time Recommendations in a Multi-Domain Environment. In *Proc. of ACM Hypertext '16*.