



Self-operating, self-learning  
forecasting assistant?

It's time to stop building forecasts  
and start acting on them

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# Re-imagine **planning & analysis**

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# Planners need more time for the S&OP process



**Planners spend 80% of the time**  
gathering and preparing the data,  
so that the S&OP process can start

**Only 20% is spent on S&OP**

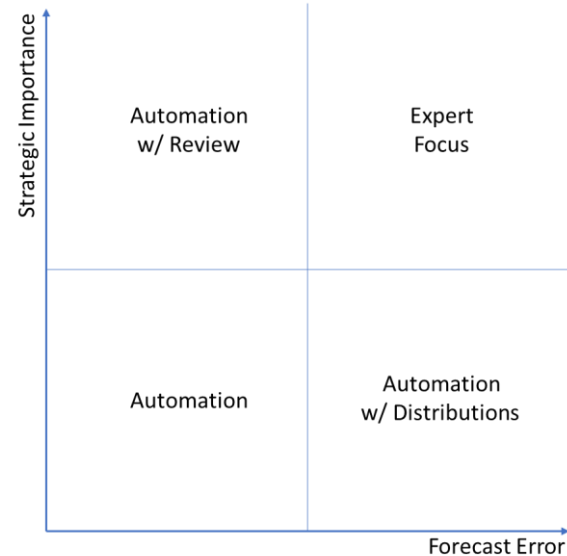
# Planners need more time for the Planning Process



**Planners spend 80% of the time**

working with Planning Elements  
that can be automated, and

**run of time with the strategically  
important Planning Elements**

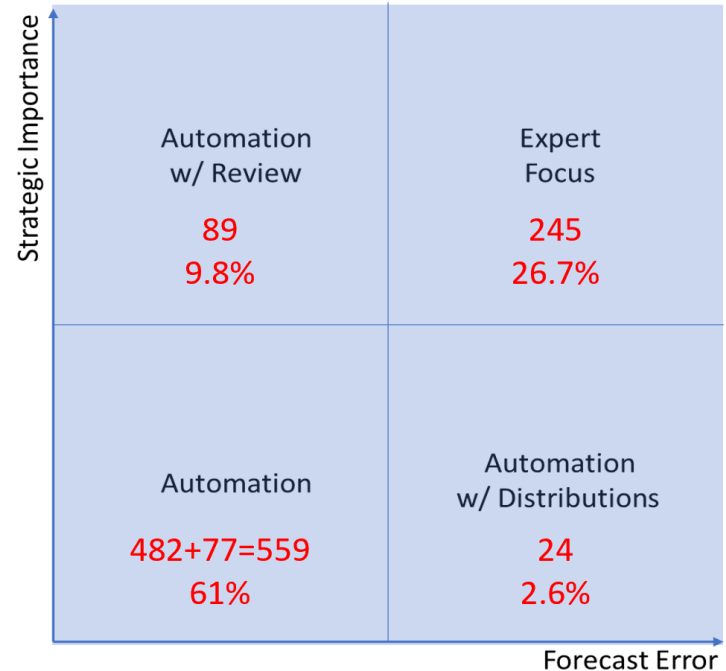


# Example from an ongoing project



**73% of materials can be  
automated**

and statistically these 73% will be  
predicted more accurately even  
w/o human intervention



**Standardized S&OP without addressing the 80% issue might lead to more structured input for some items, and some auditability of the data, to more consensus, but**

**we will run out of time; we will lack the time to process all the information and we will miss our quality targets**

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# Planners need more time for the S&OP process



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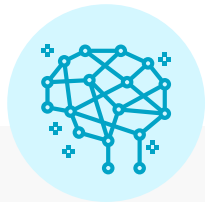


## **KAPUA Forecasting Assistant**

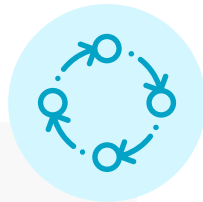
- Identify and Integrate information sources
- Find best models
- Include New Product Introductions, Promotions and Cannibalization
- Continuously adopt and improve
- Automate the 80%
- Provide 30-50% more accurate baseline forecast

# 3 main components that enable the forecasting assistant to sense and learn continuously; to produce better forecasts

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We are a search engine for the best information sources and the best models for each variable from libraries of 1000s of sources, AI and non-AI models



We continuously verify the sources and train, to identify new trends and keep the models current



We gather additional market signals using external data & Crowd Intelligence via micro-surveys

# transparent

**Planning**

Planning / Planning Detail / Daily - Unpredictable SKUs

Business Scenario & Forecasting Period Summary

#	Planning Element
271	
272	
273	
274	
275	
276	
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294	
295	
296	

### Error Analysis

Planning Element: PC-W-100087.7 | Planning Element ID: 30KRLVYRUCMCHVZLQZJHMPREUWES

MAPE: 6.10%      COV: 0.131

Naïve Forecast: 13.20%      Forecasting Period: 2 week out

#### Forecast vs Actuals

#### Error Distribution

#### Box Image

#### Data Snapshot


CoV	MAPE	Naive
129	7.300%	11.400%
131	6.100%	13.200%
133	9.200%	13.600%
129	10.500%	12.900%
130	10.900%	13.100%
140	11.600%	14.400%
144	13.800%	14.100%
130	11.500%	16.800%
129	12.300%	17.700%
141	13.100%	14.800%
145	14.700%	16.200%
130	11.300%	33.500%
173	5.000%	7.300%
175	7.900%	18.900%
175	10.500%	36.900%
174	12.200%	50.100%
175	14.200%	49.200%
174	9.700%	57.500%
175	10.400%	63.600%
174	21.700%	53.600%
174	8.900%	36.100%
175	11.900%	25.300%
174	10.700%	27.800%
172	7.700%	20.300%
173	12.700%	15.000%
175	13.700%	13.700%

For additional information, visit help pages: [EN](#) | [ES](#).

Close



# ...is showing forecasted numbers in an easy to use user interface



- Home
- Dashboard
- Planning
- Micro-Surveys

Q Type in your search here...

KAPUA Admin logo

**Planning**  
Planning / Planning Detail / 684 Planning Elements

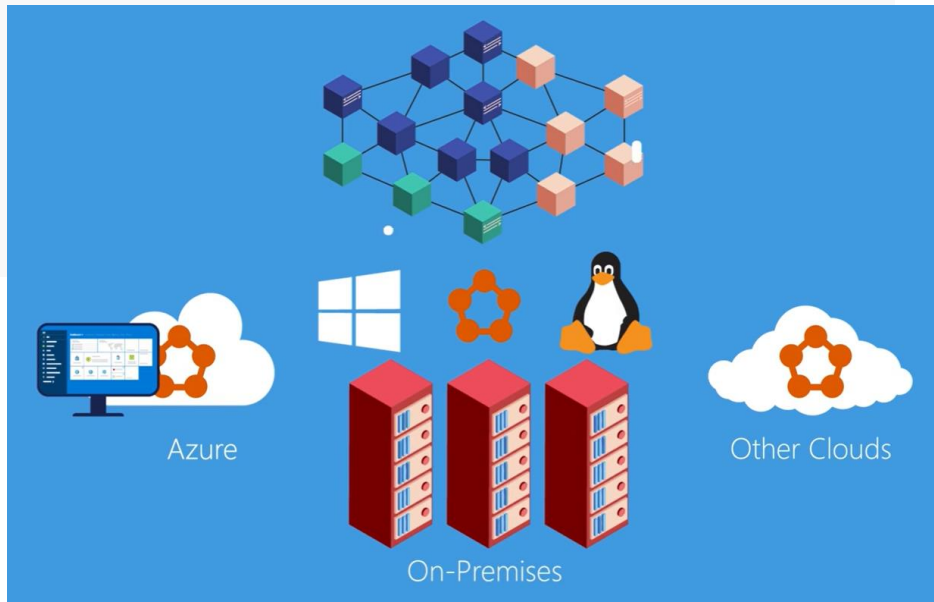
**Data Info**  
Business Scenario: Top PEs combining Subregions - Product Groups  
- SKU

**Available Predictions**  
2019-06-06

Drag here to set row groups

...	1 ↑	re 2 ↑	st 3 ↑	N 4 ↑	Max...	Period	Fore...	Long...	Long...	Long...	Shor...	Shor...	Shor...	Budg...	MAPE
0 - Total	0 - Total	0 - Total	2019-06...	2019-06...	1 week ...	1,965,241	3,040,277	11	4.50%	1,006,070	4	7.50%	2,212,071	3.30%	
0 - Total	0 - Total	0 - Total	2019-06...	2019-06...	2 weeks ...	1,893,607	4,932,765	18	3.70%	3,040,277	11	4.50%	2,212,071	6.00%	
0 - Total	0 - Total	0 - Total	2019-06...	2019-07...	3-6 wee...	1,913,773	12,573,1...	46	2.20%	4,932,765	18	3.70%	1,900,814	3.00%	
0 - Total	0 - Total	0 - Total	2019-07...	2019-08...	7-10 we...	1,872,337	20,045,2...	74	1.00%	12,573,1...	46	2.20%	2,077,440	3.90%	
0 - Total	0 - Total	0 - Total	2019-08...	2019-08...	11 week...	1,786,935	22,042,6...	81	1.40%	20,045,2...	74	1.00%	1,810,657	6.60%	
0 - Total	0 - Total	0 - Total	2019-08...	2019-09...	12 week...	1,976,999	24,937,1...	88	1.50%	22,042,6...	81	1.40%	2,172,788	6.70%	

# ...integrates into your existing system landscape with Azure Service Fabric and Django REST framework



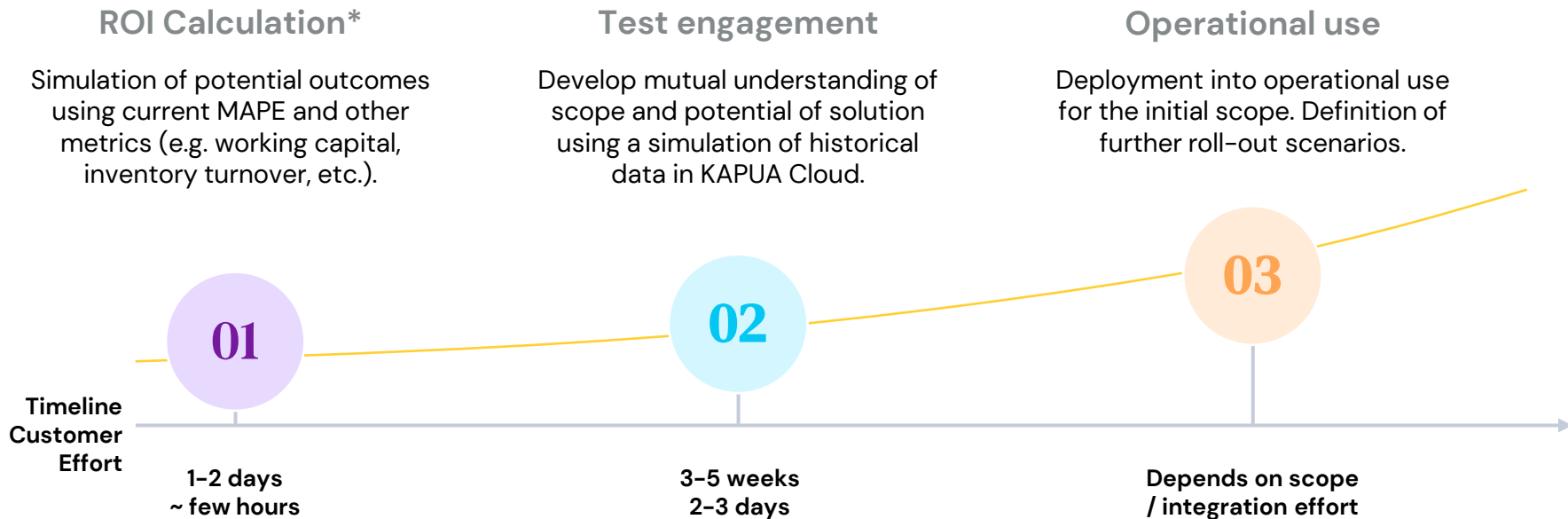
A small pilot is a great way to gain  
certainty and get results with own data

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How we do it:  
**Let's do a test!**

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# Proven value in weeks, not months or years



\* ROI calculation mostly makes sense for Demand Planning Scenarios

# Example of test results

Detailed analysis of data (in scope) and potential of using **Kapua Cloud**.

	planning element	forecasting period	% days with data	mean	CoV	MAPE	naive MAPE
0		0-30 days out	88.8%	9721	0.15	3.6%	25.3%
1		30-60 days out	88.8%	10247	0.10	4.1%	34.8%
2		60-90 days out	88.8%	10135	0.10	23.5%	40.6%
3		0-30 days out	88.0%	3478	0.29	5.0%	23.4%
4		30-60 days out	88.0%	3717	0.27	5.1%	43.4%
5		60-90 days out	88.0%	4086	0.21	11.0%	65.1%

CHART TO: FORECASTING PERIOD 0-30 days out  
MAPE:5.0% Naive MAPE:23.4%

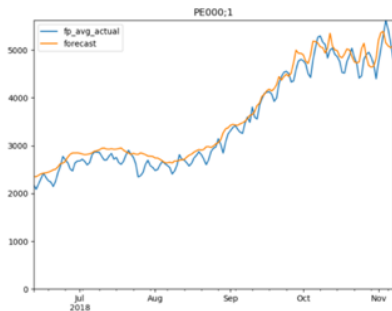


CHART TO: FORECASTING PERIOD 30-60 days out  
MAPE:5.1% Naive MAPE:43.4%

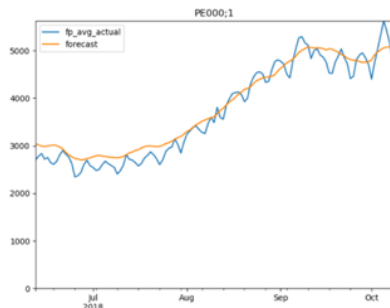
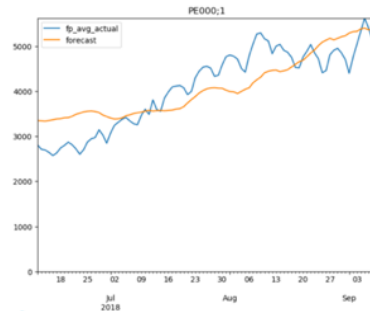
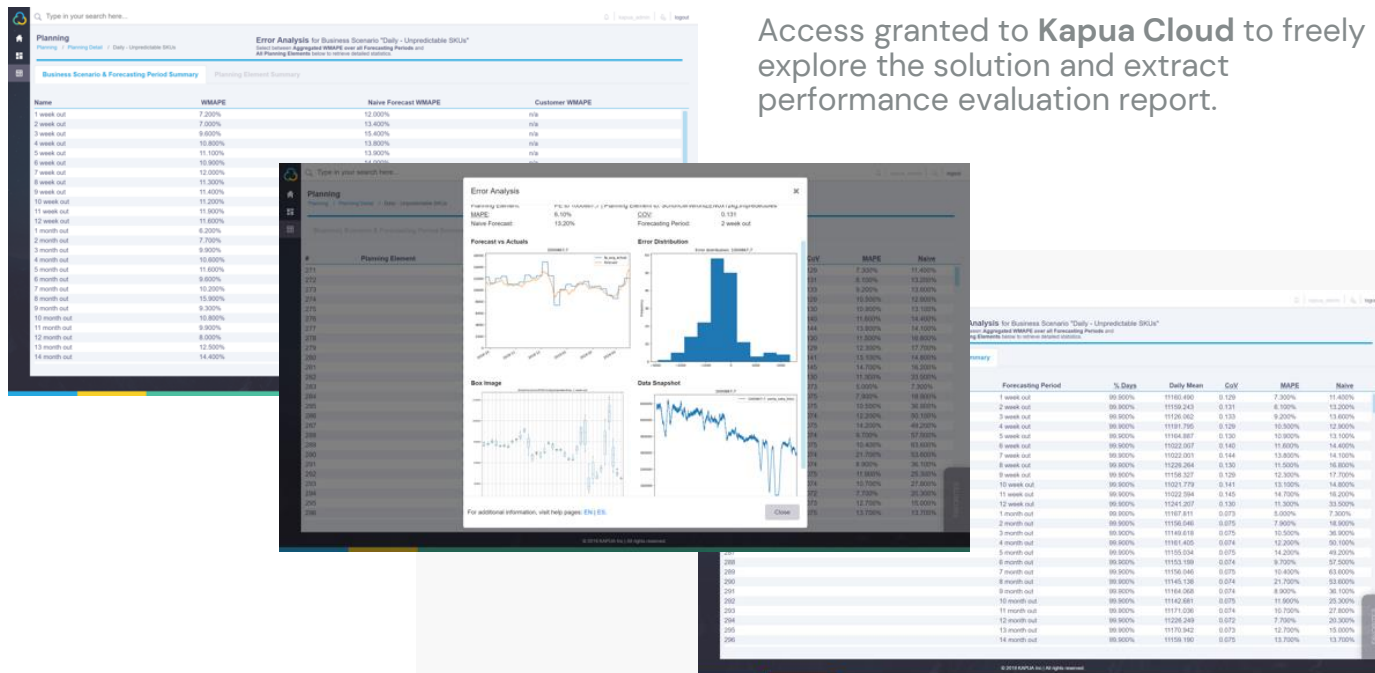


CHART TO: FORECASTING PERIOD 60-90 days out  
MAPE:11.0% Naive MAPE:65.1%



# Example of test results



# Architecture overview

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# Background to the idea

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- There has been tremendous progress in computer algorithms during the last few years. Amazon, Google, Facebook... are powered by algorithms that have to potential to revolutionize Enterprise Software.
- KAPUA is porting these algorithms to the world of Enterprise Planning and Forecasting.
  - We make algorithms scalable; the accuracy should not be great for just one product with the involvement of a human data scientist, it should be great to hundreds or thousands of different products, in different channels, customer groups, regions... without the need for a big data science team
  - We make algorithms usable; many planning elements don't have massive historical data; KAPUA platform finds the algorithm with the highest ability to be accurate, given what's available
- KAPUA is combining internal and external data seamlessly
- The system learns and self-adjusts along the way



# Kapua Cloud

## SaaS

Lease and use your software, let us manage everything else (OPEX, not CAPEX).

## Turnkey Software

Enterprise-grade software that is fully turnkey to use.

## Security

Our cloud solutions are securely hosted and have multi-layer protection.

## Influence

We listen to our clients, and encourage you to share your ideas and thoughts.

## Maintenance

Multiple upgrades and code deployments per year.

## Support

Support options included in subscription.

## Public and Private Cloud

SaaS available for private cloud deployments on KAPUA's infrastructure.

## Next-Gen AI Forecasting

Automated forecasting processes w/ improved accuracy.

## Buy, don't make

Use latest technology w/o expanding your Data Science team.

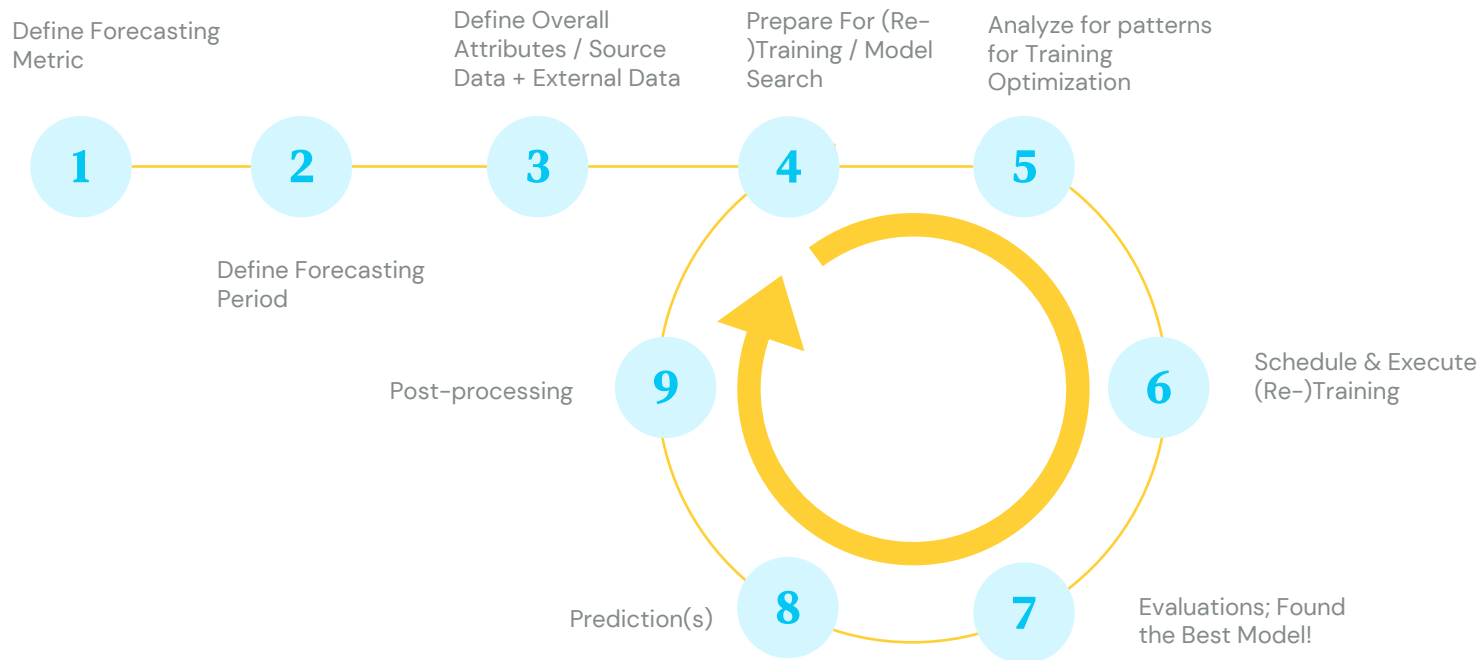
## No Data Scientists Needed

Leverage true AI and Machine Learning w/o the need to hire data scientists.



# Kapua (simplified) workflow

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# Outcome

Detailed statistics about  
the performance of your  
models and...

KAPUA Customer Tenant: Familia

Home > LEARN: KAPUA AI Training > Composite Forecasts

Composite Forecasts

246 results1414 total123

<input type="checkbox"/>	Data stream1 ^	Forecasting period2 v	Benchmark	Mape	Cov	Training img
<input type="checkbox"/>	A;KG;CBIA, Volume Net	Year_2019	0.054	0.033	0.097	my9541159.kapua.a
<input type="checkbox"/>	A;KG;CBIA, Volume Net	Year_2020	0.055	0.054	0.075	my9541159.kapua.a
<input type="checkbox"/>	A;KG;ECUA, Volume Net	Year_2019	0.070	0.064	0.162	my9541159.kapua.a
<input type="checkbox"/>	A;KG;ECUA, Volume Net	Year_2020	0.018	0.005	0.119	my9541159.kapua.a
<input type="checkbox"/>	A;ML;CBIA, Volume Net	Year_2019	0.070	0.010	0.551	my9541159.kapua.a
<input type="checkbox"/>	A;ML;CBIA, Volume Net	Year_2020	0.006	0.006	0.421	my9541159.kapua.a
<input type="checkbox"/>	A;ML;ECUA, Volume Net	Year_2019	0.070	0.040	0.530	my9541159.kapua.a
<input type="checkbox"/>	A;ML;ECUA, Volume Net	Year_2020	0.113	0.084	0.390	my9541159.kapua.a
<input type="checkbox"/>	A;ST;CBIA, Volume Net	Year_2019	0.111	0.045	0.400	my9541159.kapua.a
<input type="checkbox"/>	A;ST;CBIA, Volume Net	Year_2020	0.087	0.052	0.313	my9541159.kapua.a

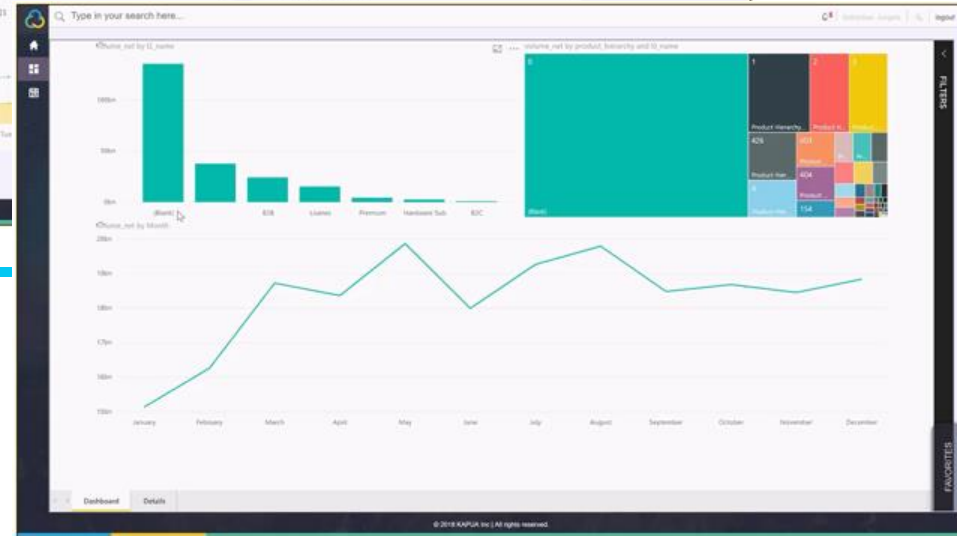
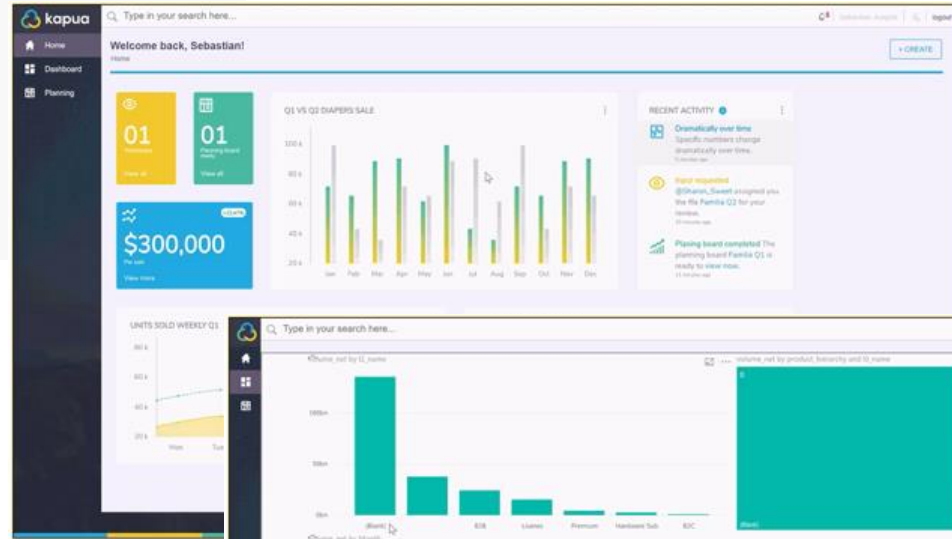
# How we do it: Business UI

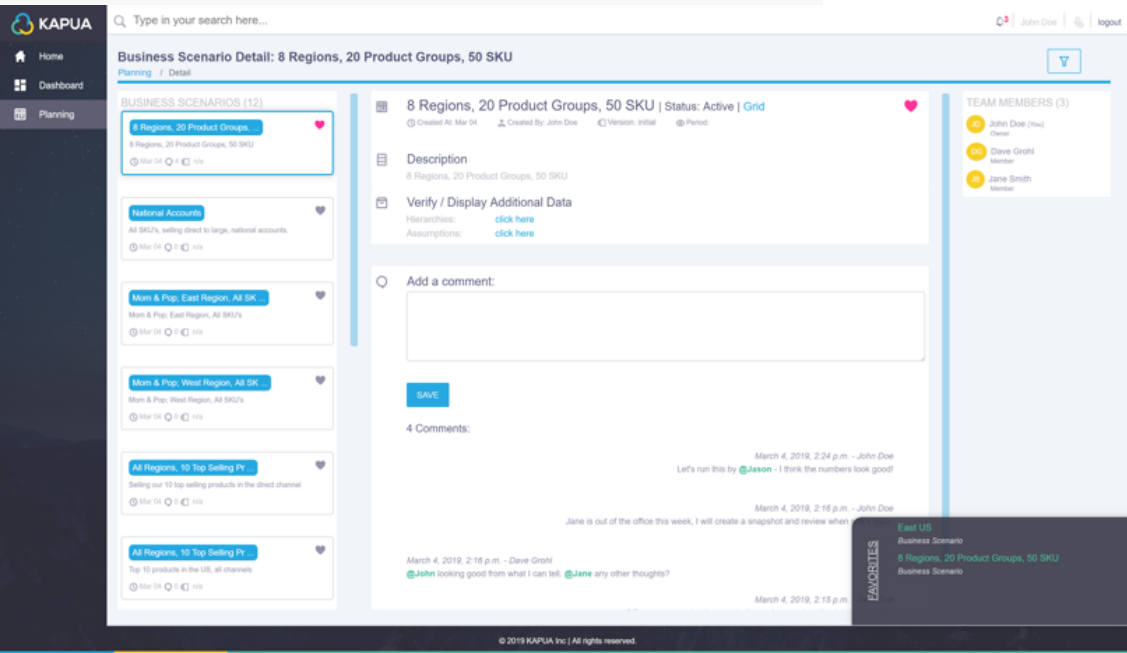
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End user interaction with KAPUA Cloud

# Modern end user interface

Easy to use end user interface with powerful dashboards and visualization of your forecasts





# Collaboration built-in

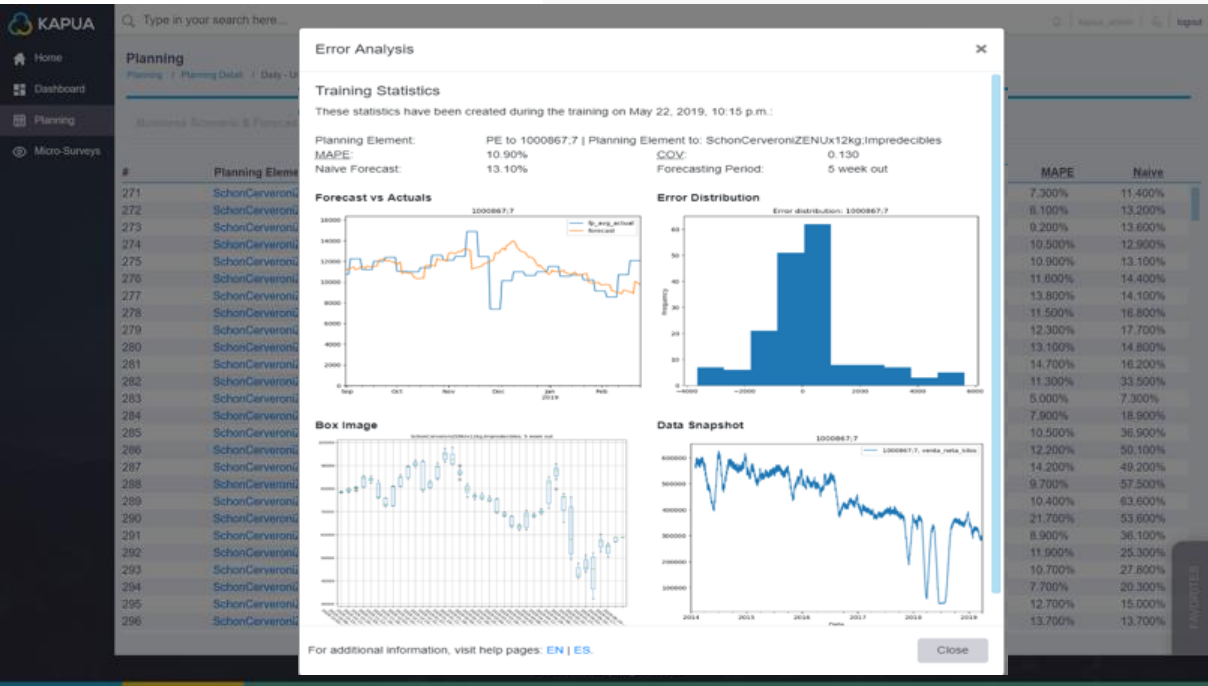
No more emails, multiple  
spreadsheets and side  
conversations. Align with  
your peers and manage your  
forecast in a single location.

# A UI that planners love

If you're working with spreadsheets today, then you will love KAPUA: with an easy-to-use spreadsheet-based UI, you will be able to review, analyze and amend the forecasts generated by the system.

The screenshot displays the KAPUA Planning interface. At the top, there's a search bar and navigation tabs for Planning, Data Info, and Available Predictions. The main area shows a table with columns for Product Group, State, Min/Max Date, Period, Forecast, User Corrected, and Actuals. The table lists various product groups (P442 Wine Refrigerator) across different states (Florida, Georgia, New York, North Carolina) and time periods. A sidebar on the right contains a 'COMMENTS' section with recent updates and a 'SNAPSHOT' section for saving and managing data snapshots. The bottom of the interface shows the copyright notice: © 2019 KAPUA Inc | All rights reserved.

Product G...	State 2	Min_Date 3	Max_Date	Period	Forecast	User Corrected	Actuals
P442 Wine Refriger...	Florida	2018-08-28	2018-09-04	2 weeks out	2,163,832	0	2,445,841
P442 Wine Refriger...	Florida	2018-09-04	2018-10-02	3-6 weeks out	2,070,342	0	2,421,519
P442 Wine Refriger...	Florida	2018-10-02	2018-10-30	7-10 weeks out	2,116,364	0	2,273,227
P442 Wine Refriger...	Florida	2018-10-30	2018-11-06	11 weeks out	1,550,902	0	2,462,287
P442 Wine Refriger...	Florida	2018-11-06	2018-11-13	12 weeks out	1,719,230	0	2,435,372
P442 Wine Refriger...	Georgia	2018-08-28	2018-09-04	1 week out	377,681	0	324,657
P442 Wine Refriger...	Georgia	2018-08-28	2018-09-04	2 weeks out	377,681	0	324,657
P442 Wine Refriger...	Georgia	2018-09-04	2018-10-02	3-6 weeks out	394,403	0	365,539
P442 Wine Refriger...	Georgia	2018-10-02	2018-10-30	7-10 weeks out	488,772	0	369,000
P442 Wine Refriger...	Georgia	2018-10-30	2018-11-06	11 weeks out	503,128	0	365,648
P442 Wine Refriger...	Georgia	2018-11-06	2018-11-13	12 weeks out	633,130	0	457,499
P442 Wine Refriger...	New York	2018-08-28	2018-09-04	1 week out	106,005	0	104,234
P442 Wine Refriger...	New York	2018-08-28	2018-09-04	2 weeks out	106,005	0	104,234
P442 Wine Refriger...	New York	2018-09-04	2018-10-02	3-6 weeks out	107,267	0	67,009
P442 Wine Refriger...	New York	2018-10-02	2018-10-30	7-10 weeks out	161,036	0	81,675
P442 Wine Refriger...	New York	2018-10-30	2018-11-06	11 weeks out	247,040	0	37,995
P442 Wine Refriger...	New York	2018-11-06	2018-11-13	12 weeks out	127,897	0	46,348
P442 Wine Refriger...	North Carolina	2018-08-28	2018-09-04	2 weeks out	540,940	0	581,446
P442 Wine Refriger...	North Carolina	2018-08-28	2018-09-04	1 week out	540,940	0	581,446
P442 Wine Refriger...	North Carolina	2018-09-04	2018-10-02	3-6 weeks out	554,564	0	581,269
P442 Wine Refriger...	North Carolina	2018-10-02	2018-10-30	7-10 weeks out	552,922	0	572,215
P442 Wine Refriger...	North Carolina	2018-10-30	2018-11-06	11 weeks out	572,840	0	645,475
P442 Wine Refriger...	North Carolina	2018-11-06	2018-11-13	12 weeks out	484,295	0	448,983



# Built-in accuracy analysis

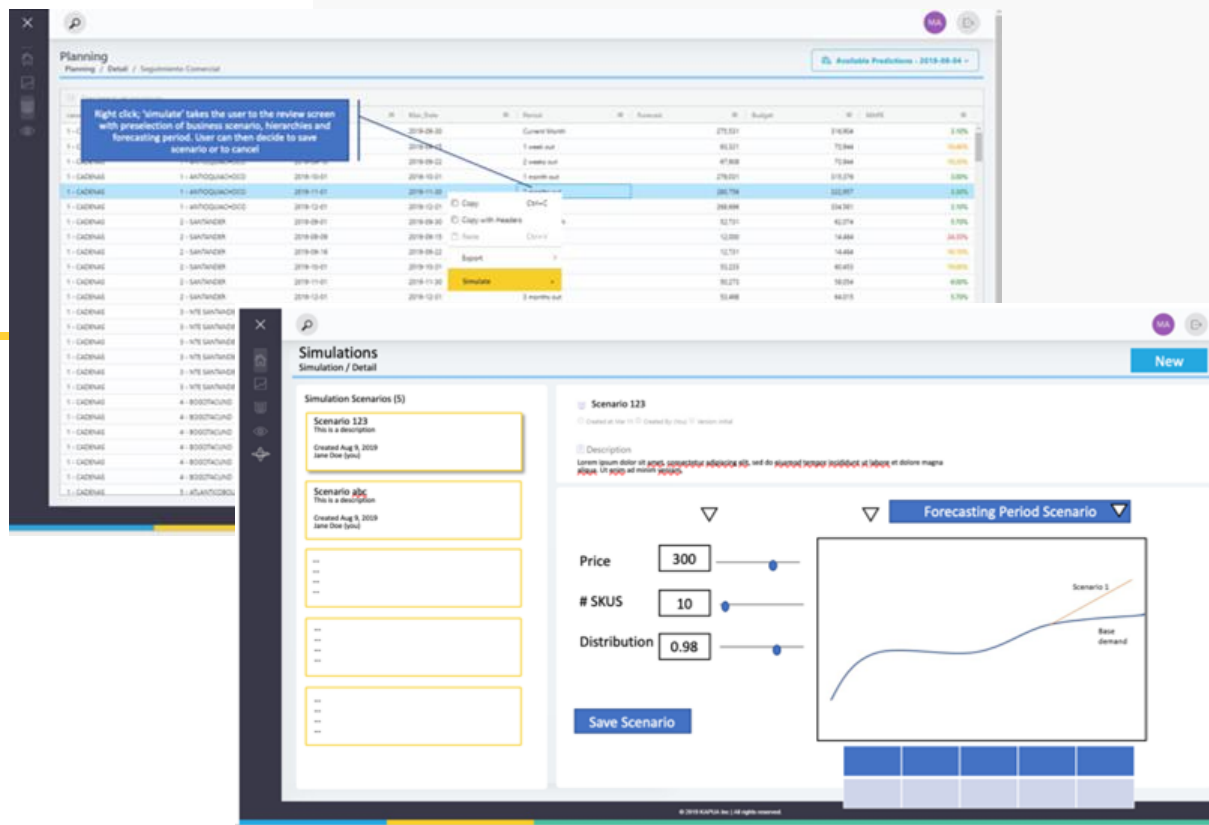
Building trust and driving user adoption with:

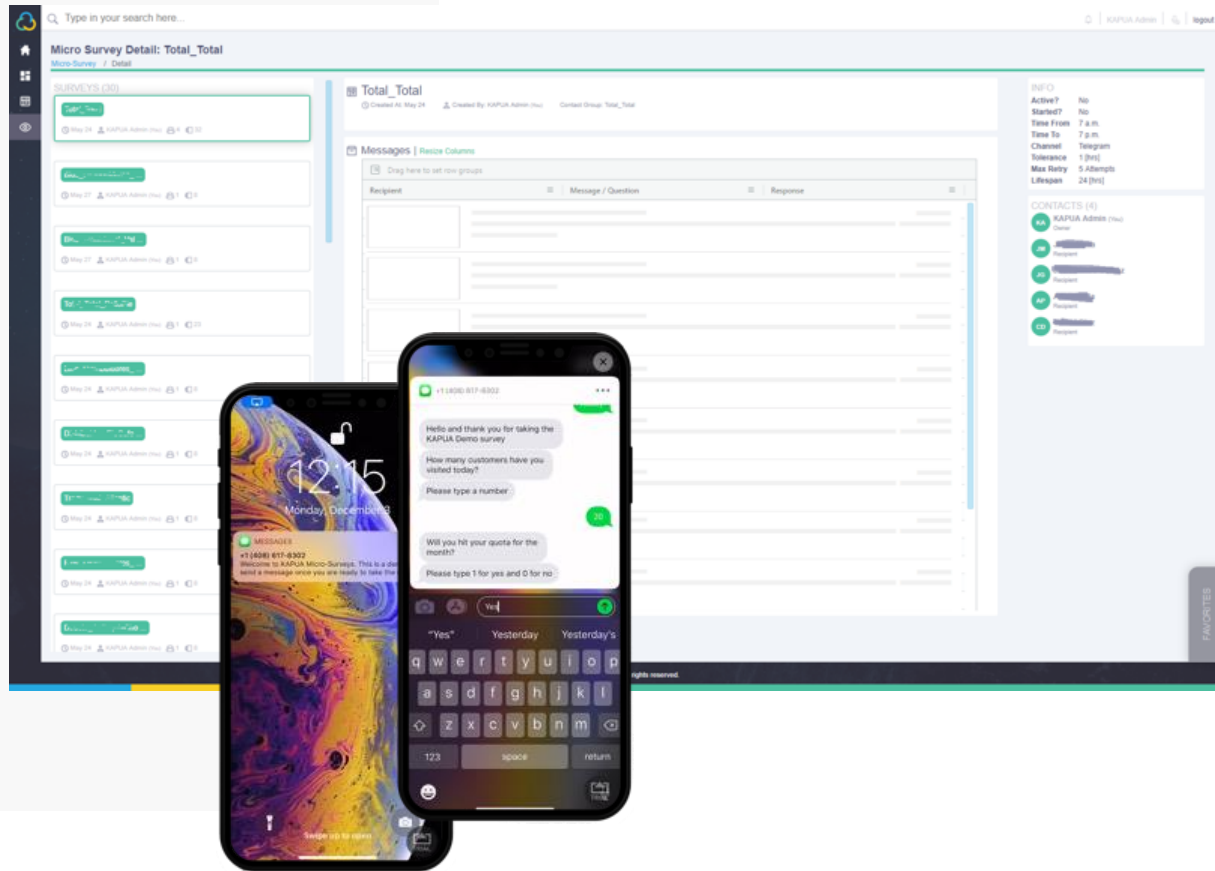
- Accuracy analytics
- Forecast vs actuals
- Error Distribution
- Forecast Box Plot
- Forecast Histogram
- Etc.



## Scenario planning & what if scenarios

Understand the impact of both controllable & uncontrollable variables in your business results. (This functionality is being designed together with selected customers)





# Micro surveys

Ask your crowd via SMS,  
WhatsApp, FB Messenger or  
Telegram

Micro-surveys are designed  
to quickly and very easily  
gather sentiment from  
inside or outside your  
organization to further  
increase your forecasting  
accuracy.

# Let's talk

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## Appendix

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# Existing forecasting systems force people into spending 80% of the time in number crunching

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## Microsoft Excel

is the tool in planning and forecasting

Many have tried to move the process into **forecasting solutions**, most have struggled

**Conventional software** depends on the company being able to exactly describe how the dependencies are between different input variables

- Customer orders, consumption data, market research, media data, panels, production changes...

- On data with dozens of millions of data points time cadence dependent sources

## Markets change, customers change, channels change

And the definitions become obsolete before they even reach productive use. People need to move back to the spreadsheets

## Companies have the solution X

But they do much of the work in Excel and once done, they upload it into the planning solution for downstream processing

**With the proliferation of SKUs, micro-brands, channels, and with the changes in the customer preferences away from established brands to convenience, we must automate large % of forecasts, or we will fail, we will not have enough manpower to create all the forecasts with the accuracy that is needed for businesses to be successful**



### **Vulnerability**

The vulnerability of the system to how well someone can play it will increase



### **Extra-work**

It could be just too much work and distraction from the actual priority



### **Measuring forecast**

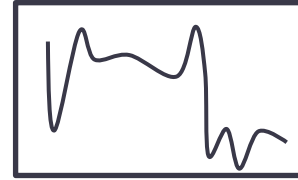
People will end up using the consensus number w/o measuring forecast value add, w/o having the time for statistical forecasts, with all the bias and vulnerability of such a process

# SCENARIOS AT OUR CUSTOMERS

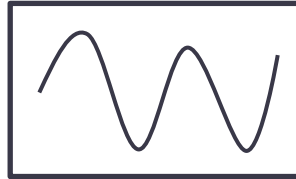
**Predictable SKUs**



**Unpredictable SKUs**



**Highly Seasonal SKUs**



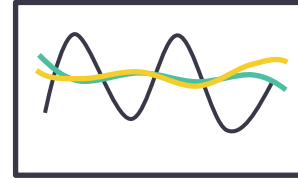
**New Product Launches**



**SKU Cannibalization**



**Commodity Prices**



**Long-Term Plans (1-5 years)**



# Scenarios at our customers:

## Demand Planning

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### Internal and External

- Client Orders, Market Research, Economic Indicators, POS data, Weather...

### Types of Predictions

- Volume; Usually by week, e.g. 12 weeks out, or my month, e.g. 3 or 6 months out
- Very Granular; down to by SKU and retail location
- Measurement of the impact of in-store promotions

### Motivation

- General tension between working capital cost and the customer service level
- Manage to lower the error (MAPE) by 30–50%
- Help in both dimensions – spend less on working capital and have higher customer service level / higher revenue



# Scenarios at our customers:

## Financial/Marketing Planning

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### Internal and External

- Client Orders, Market Research, Economic Indicators, POS data, Weather...

### Types of Predictions

- Volume and Value
  - Current month, quarter and year,
  - Next year
  - Up to 5 years

- Scenario Planning / What-If Analysis

What happens if the environment changes (exchange rate, commodities prices, new competitors...)

### Motivation

- Better starting point for discussions; Know what outcome is most probable at no change to strategy
- Better outcomes; the scarce internal resources can focus on the important items and the KAPUA prediction is sufficiently accurate for B and C items w/o further modifications

# Scenarios at our customers:

## Sales Planning

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### Internal and External

- Client Orders, Market Research, Economic Indicators, POS data, Weather...

### Types of Predictions

- Volume and Value
  - Current year and next year, monthly
  - (Much) more granular than Financial Planning with regards to region, channel, sales org or product dimension, down to the forecast for each Sales Agent

### Motivation

- Translate approved financial forecasts into sales targets with very little human intervention needed
- Use the actual distribution in the data (seasonality, trend, local peculiarities) to break down from yearly financial targets for much more granular sales targets

# Even a small change in accuracy

## can have huge implications on the bottom line

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Example: impact of accuracy increase from 7.5% error to 4.7% error on a 300M USD business

### Current KPI's

- Actual Service Level (Fulfillment Rate) = 90%
- Target Service Level (Fulfillment Rate) = 92%

### KAPUA Potential

- Service Level with KAPUA Accuracy = + 8.3% (to 98.3%)
- Change in Inventory Level = + \$500k
- Change in Gross Margin = + \$27.5M
- Change in Profit of the Company = + \$26.9M (+9%)