



# PREDICTIVE FIELD OPERATIONS

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*Business. Simpler. Better.*



# About P1M1



42 people R&D



Young Entrepreneur of  
the year 2012



INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

2 ongoing EU project

10 Government  
Funded  
R&D Projects



Fastest growing  
company in Turkey.



2 Ministry of Industry  
R&D Project

MIT  
Technology  
Review

35 under 35



5 University  
Cooperation



# P1M1 Locations



**Istanbul – Toronto – Kiev – Brussels**



# Predictive Field Operations (PFO) Decision Levels

## Strategic

- Supply Network Design
- Product Mix Optimization

## Tactical

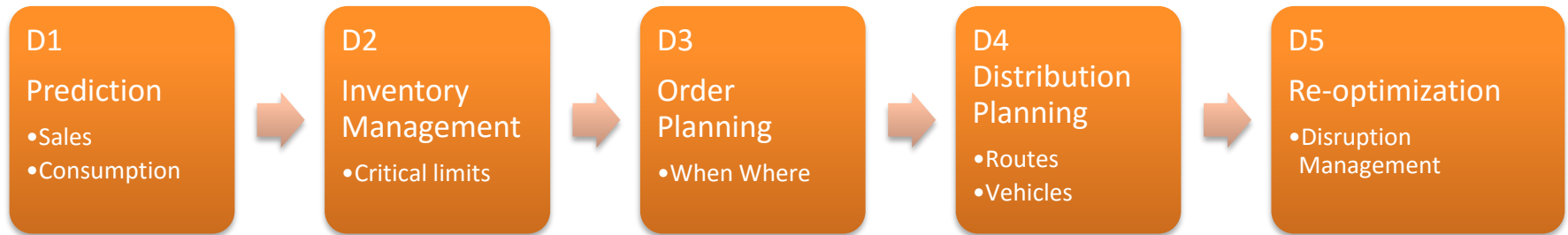
- Location Analytics
- Workforce Optimization
- Operational Scenario Analysis
- Field Sales Team Effectiveness

## Operational

- Prediction
- Economic Inventory Management
- Order Planning
- Routing / Distribution Optimization



# 5 Decisions of PFO







# D1 – PREDICTION

Strategic

Tactical

Operational



How to predict daily transactions in the field.

D1

D2

D3

D4

D5

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## D2 – INVENTORY MANAGEMENT

Strategic

Tactical

Operational



**What is the critical amount that needs to be stored at each location?**

D1

D2

D3

D4

D5

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# D3 – ORDER PLANNING




**When and how much  
should we replenish  
those points?**

D1 → D2 → D3 → D4 → D5

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An aerial photograph of a city street grid. A yellow bus icon is positioned on a street on the left side. A red location pin is placed on a street on the right side. The text 'What is the optimum distribution plan that can be utilized?' is overlaid in large, bold, black font across the top half of the image.

# What is the optimum distribution plan that can be utilized?







# DECISION 5 – RE-OPTIMIZATION



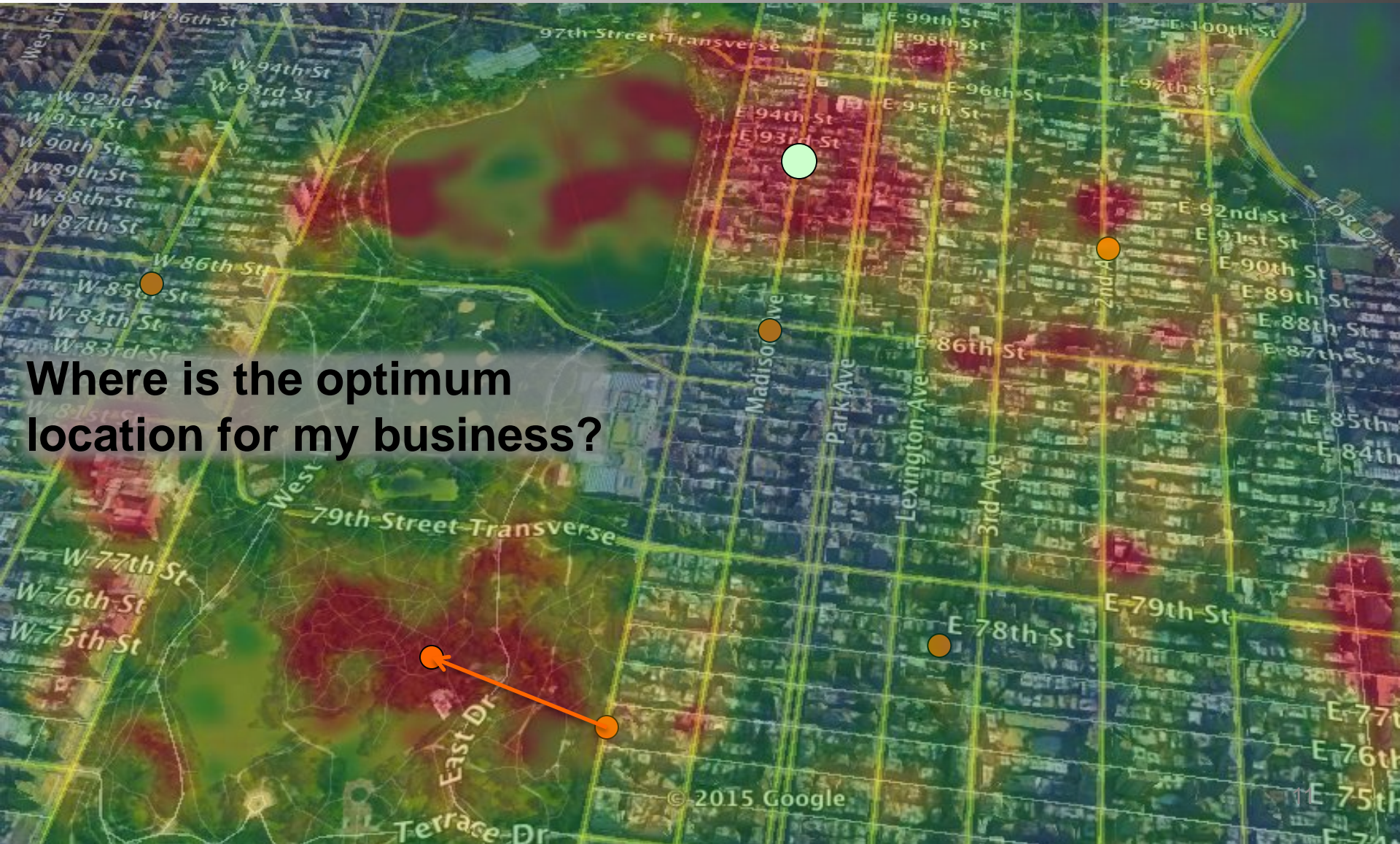
How to re-route when an intra-day emergency request is taken?







# LOCATION ANALYTICS



**Where is the optimum location for my business?**





# WORKFORCE OPTIMIZATION



How can I optimize the workforce allocation?





# CASH ANALYTICS – CASH+





# PROBLEM DEFINITION





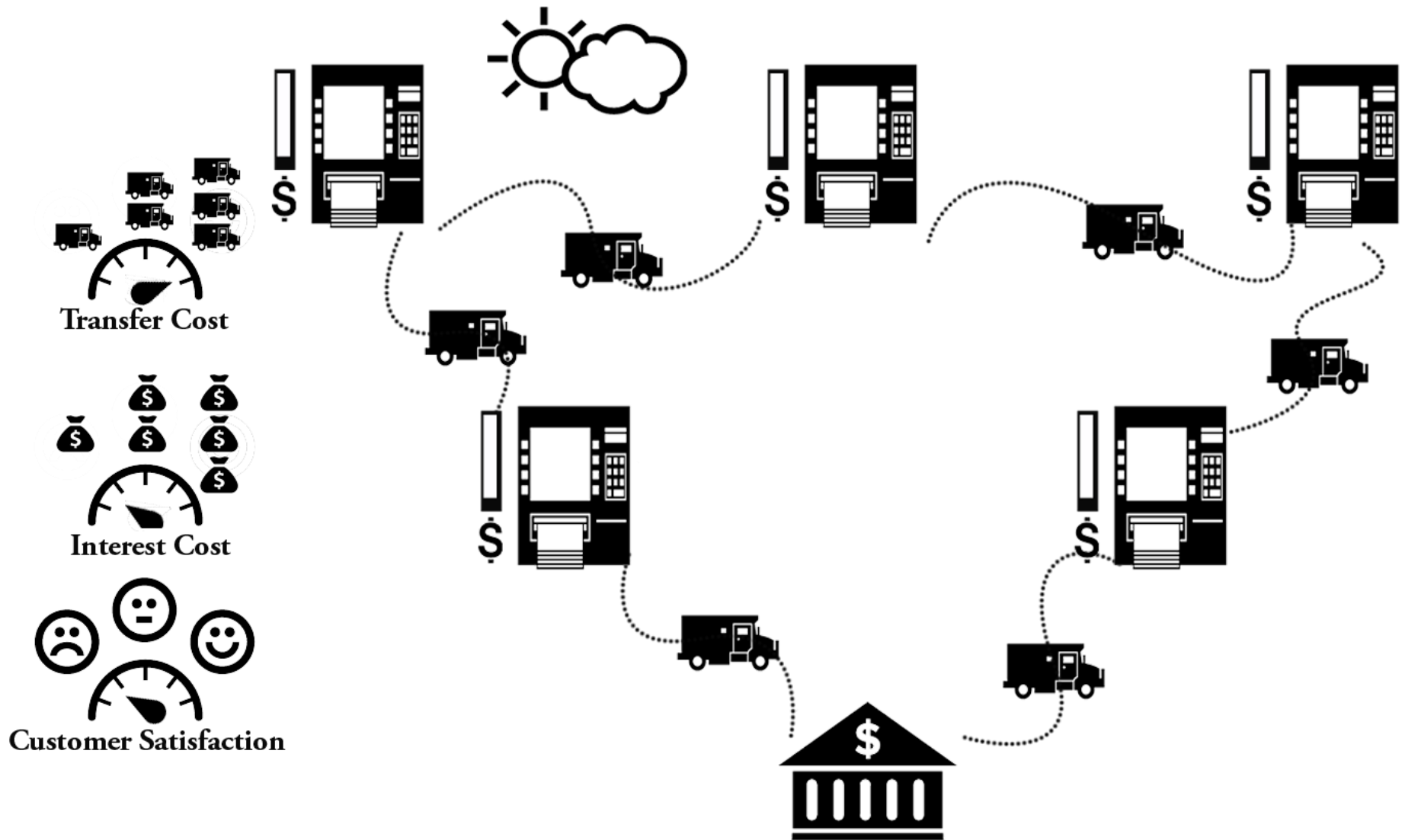


# PROBLEM DEFINITION





# PROBLEM DEFINITION

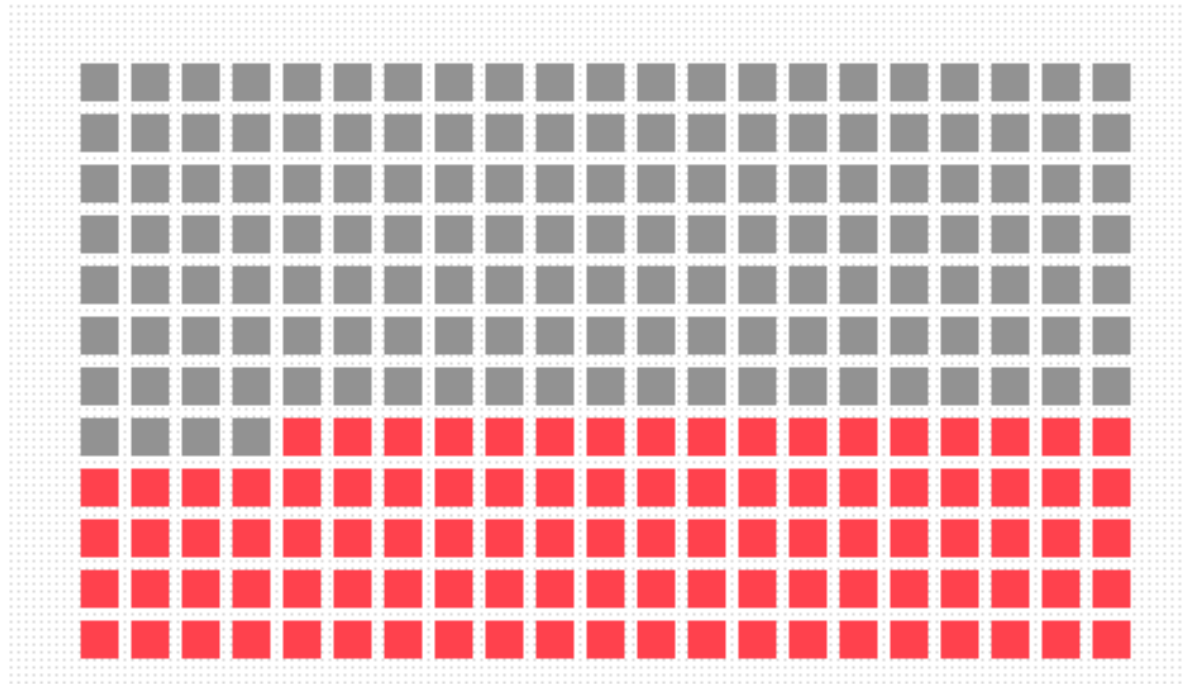






# PROBLEM DEFINITION

Average idle cash in banking industry...

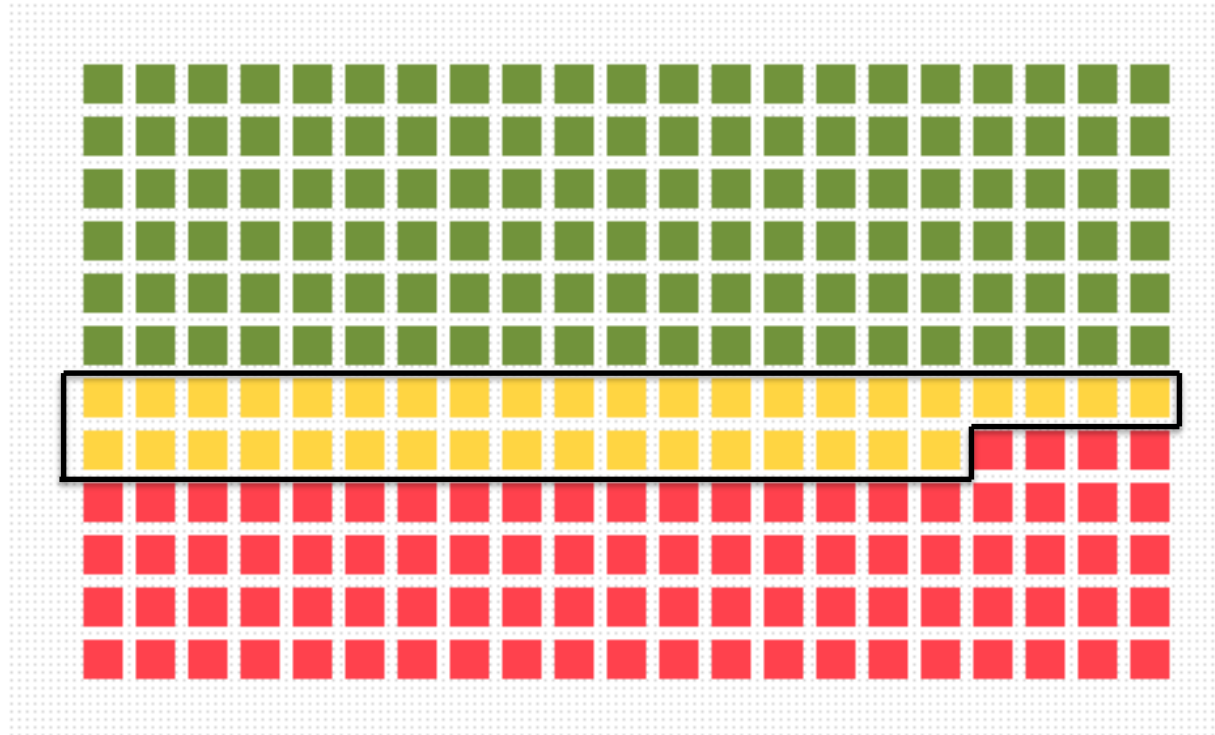


Average  
%40

■ Active Cash ■ Idle Cash



# POTENTIAL



Active Cash

Saving by %10

Idle Cash

Savings can be up to **6 Million USD / year** depending on the size of a bank.

Proof of concept works showed that it's possible to reduce the idle cash amount by %30!





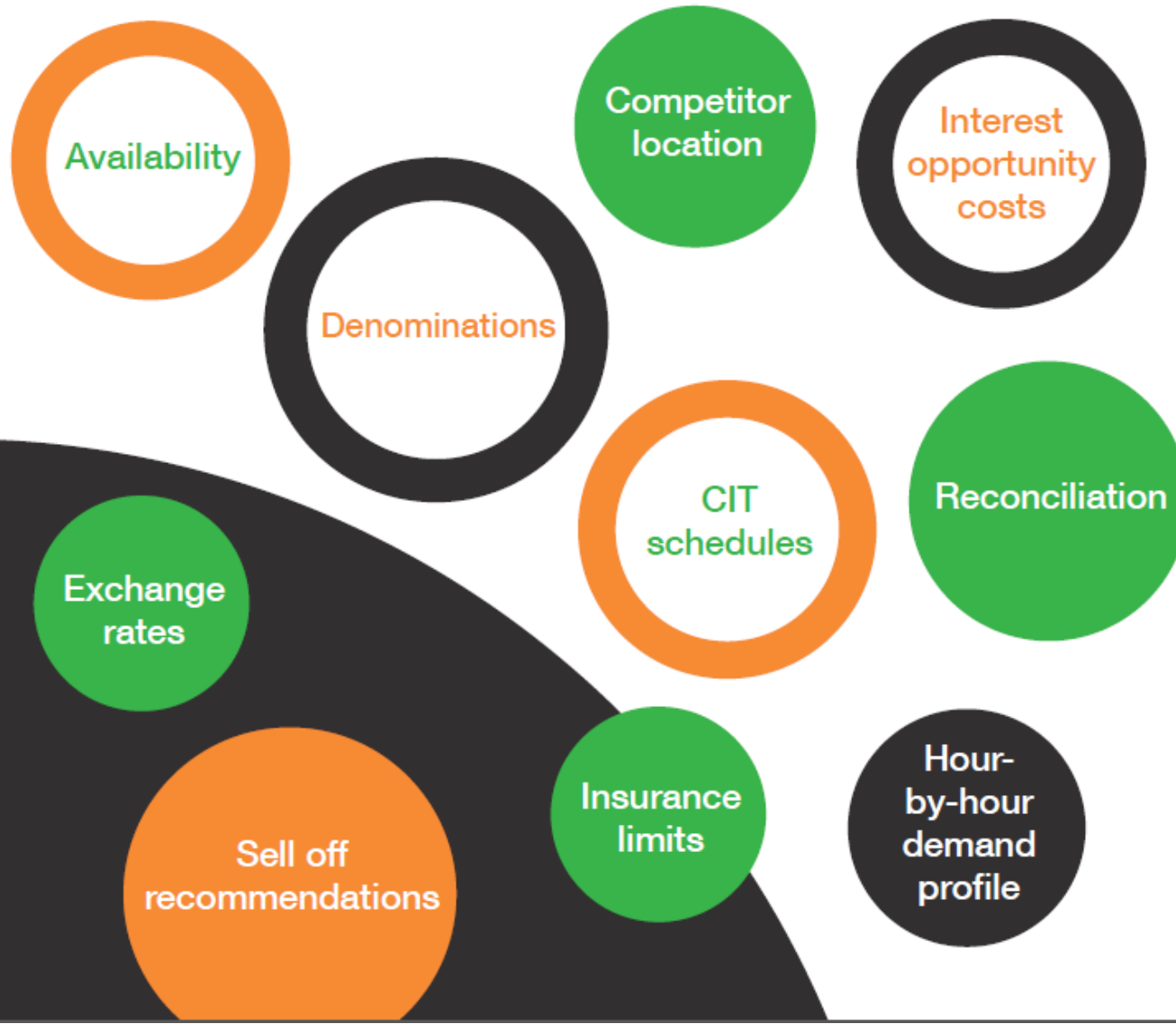
# TRANSACTION FORECASTING





# PLANNING ALGORITHM

## Cash Replenishment Schedule Optimization



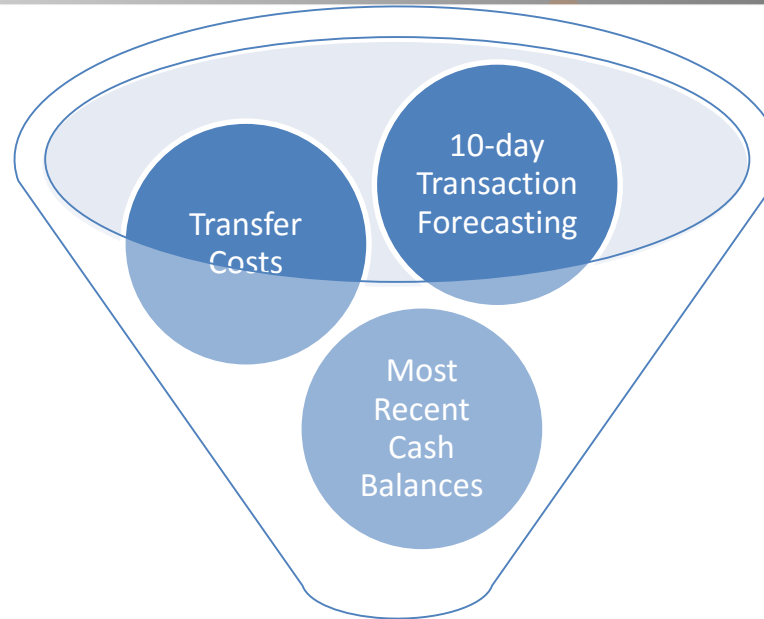




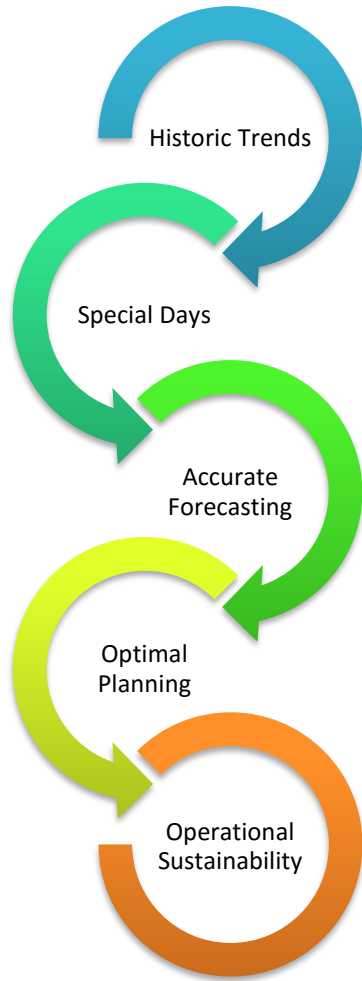


# PLANNING ALGORITHM

## Cash Replenishment Schedule Optimization



**Planning Algorithm Cash  
Transfer Outputs**

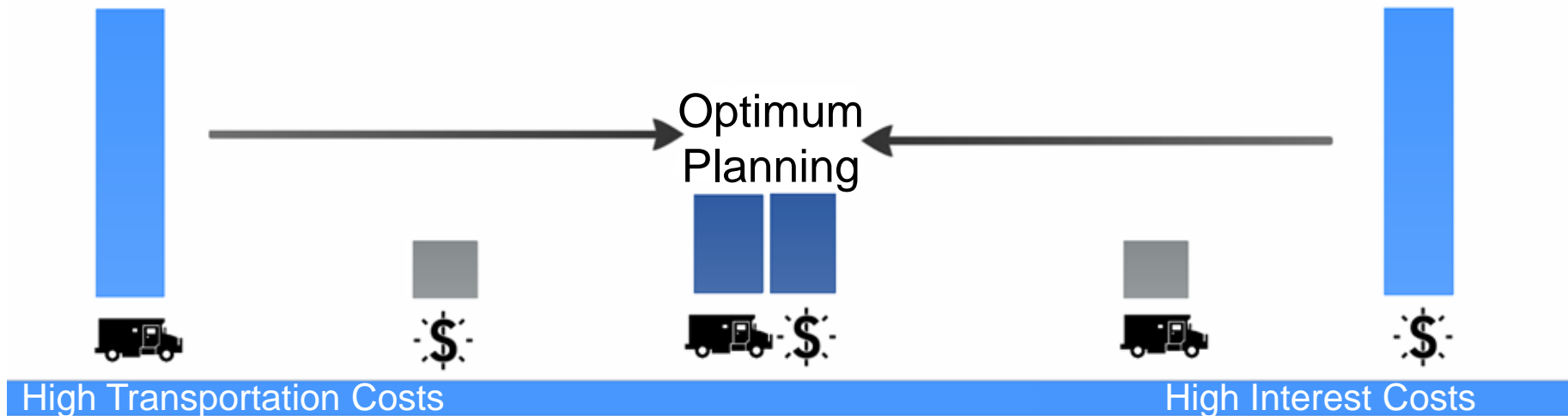






# CASH+ OBJECTIVE

Cash+ aims to **minimize the total cost** of cash operations by **forecasting** the cash transactions in the ATM network and **optimizing** the transportation plans everyday.





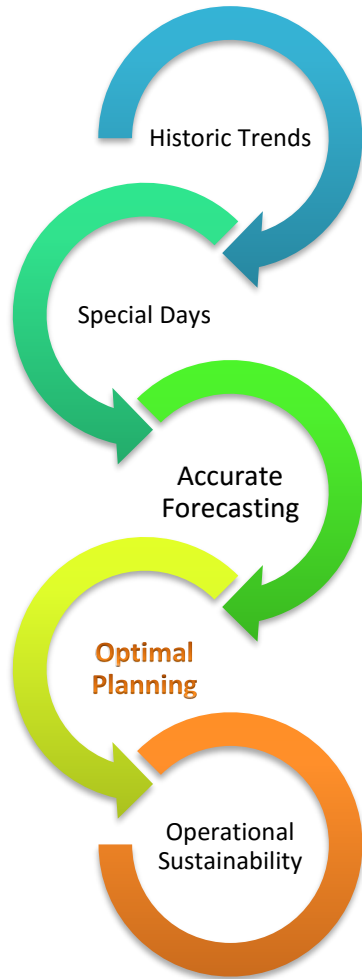
# PLANNING ALGORITHM

## Cash Replenishment Schedule Optimization

### Recycle & Branch Planning

Recycle planning complicates the planning process since deposit and withdrawal should be planned in a more integrated fashion.

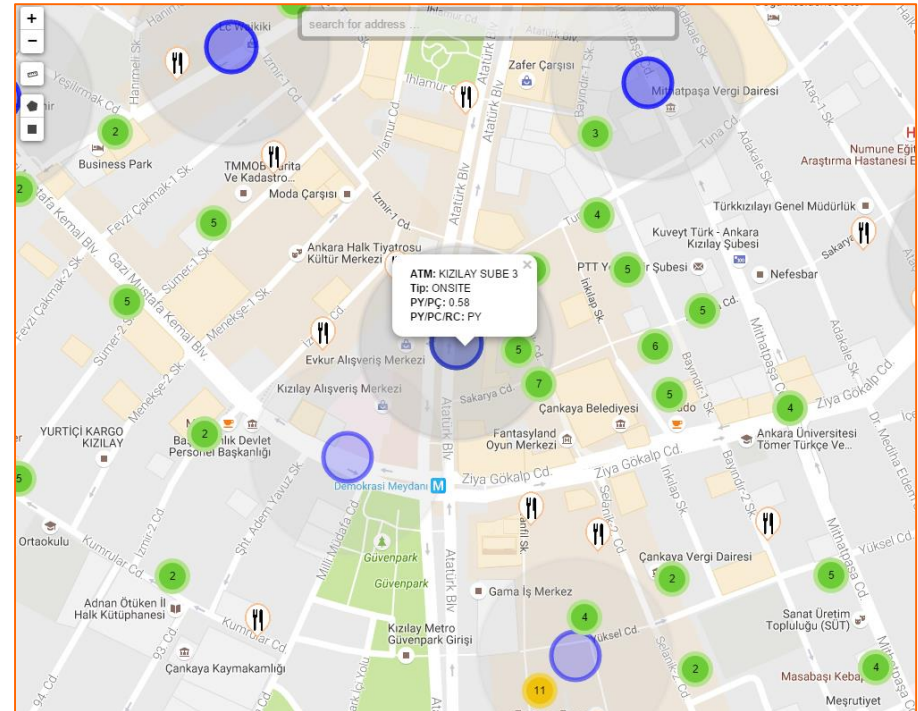
Branch is even harder since there is no limit on withdrawal and deposits.







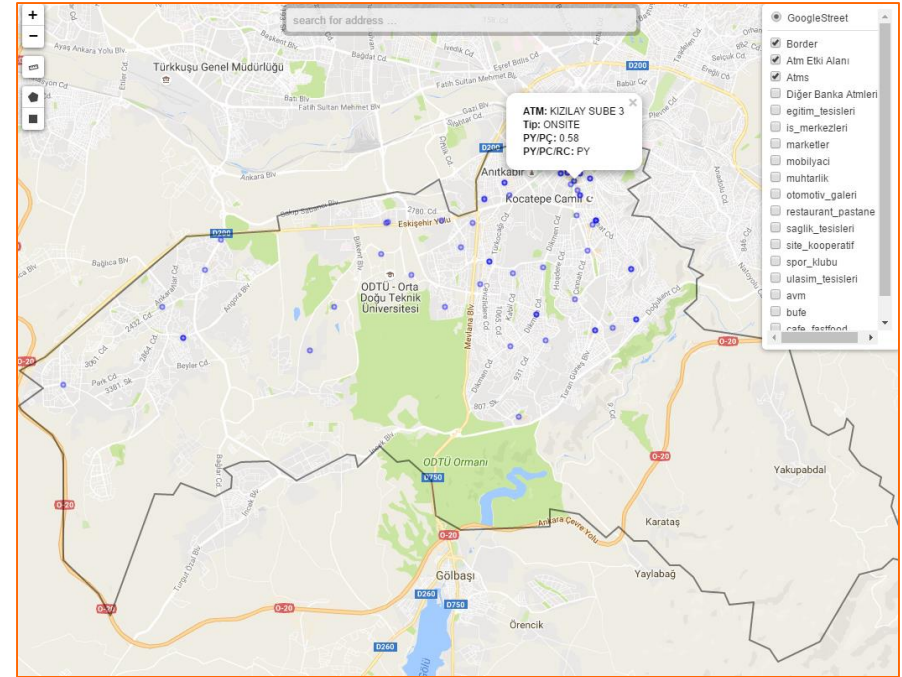
# Basic Analytics Package



- Viewing of P1M1 and Bank maps
- Location-based data analyzer
- Map-based analysis of existing network



# Location Analytics Package



- New ATM Location Proposal
- ATM Replacement Proposal
- ATM Removal Proposal
- Co-Location analyzer
- ATM Clustering
- Foreign Currency Proposal
- Opportunity Maps
- Alarm distribution maps





# Reporting Package

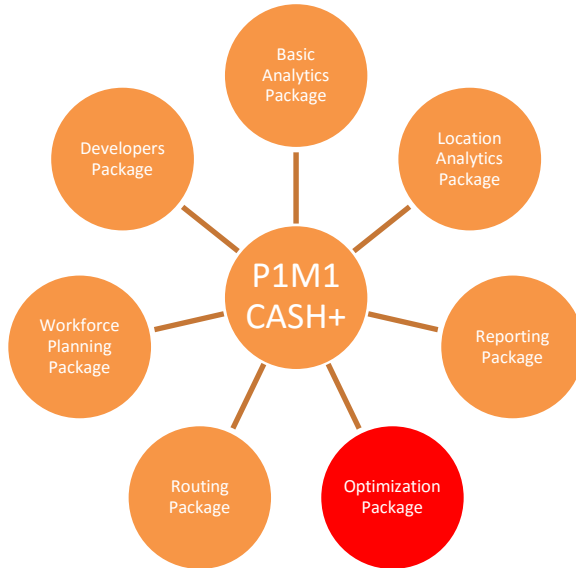


ATM Listesi ve Seçim								
ATM ID	ATM Adı	ATM Tipi	Statüs	Verimlilik	İşlem Adedi	Çalışma günü	PY/PC	PY/PC/R
FB151	YILDIZEVLER SUBE 1	ONSITE	ACTIVE	18108	6989	3466	1.27	PY
FB164	KIZILAY SUBE 1	ONSITE	ACTIVE	18139	17672	8461	4.19	PY
FB191	CETIN EMEC SUBE 1	ONSITE	ACTIVE	17767	6549	8007	4.75	PY
FB117	MESRUTİYET SUBE 1	ONSITE	ACTIVE	19416	11947	6941	2.17	PY
FB120	NECATİBEY SUBE 1	ONSITE	ACTIVE	19224	11002	2725	2.44	PY
FB122	06 ODTU	OFFSITE	ACTIVE	19001	2427	4191	1.62	PY
FB010	KAVAKLİDERE SUBE	ONSITE	ACTIVE	25289	3635	1803	0.91	PY
FI746	06 KENTPARK AVM	OFFSITE	ACTIVE	-846	48	5717	0.50	PY
FB029	BİLKENT SUBE	ONSITE	ACTIVE	23616	3436	3349	9.66	PY
FB060	GOP ANKARA SUBE 1	ONSITE	ACTIVE	20937	4926	777	1.11	PY
FB237	DEMİRTEPE SUBE 1	ONSITE	ACTIVE	17138	5513	6434	0.42	PY
FB288	KIZILAY SUBE 2	ONSITE	ACTIVE	16740	16518	8570	0.74	PY
FB322	CANKAYA SUBE	ONSITE	ACTIVE	16626	7911	8744	0.41	PY
FB370	EMEK SUBE 1	ONSITE	ACTIVE	16247	7722	7676	0.82	PY
FB385	06 ARCADİUM AVM	OFFSITE	ACTIVE	16068	4824	3759	0.58	PY

- Under-performer alert
- Anomaly detection
- Executive Summary Reports
- Performance Reports
- Cannibalism Reports



# Optimization Package

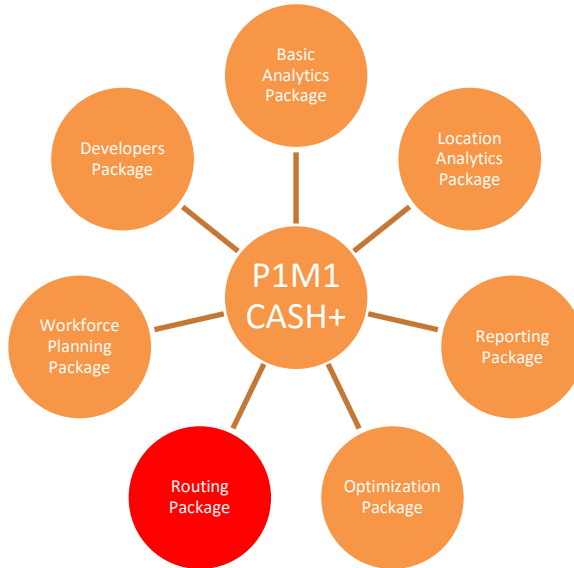


- Cassette Size Optimizer
- Cassette Type Optimizer
- Scenario Analyzer
- ATM type optimizer
- Maintenance plan optimizer





# Routing Package



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Notificationsp1m1system

Vehicles

Vehicle ID	Total Distance	Total Amount	Capacity	Occupancy	Departure	Arrival
t01	27.318	11	11	100.00	09:00:00	11:21:19
t02	14.435	15	15	100.00	09:00:00	11:40:26
t03	49.851	16	16	100.00	09:00:00	12:38:51
t04	17.314	16	16	100.00	09:00:00	12:21:18
t05	30.994	15	15	100.00	09:00:00	11:53:59
t06	86.070	14	14	100.00	09:00:00	12:59:04
t07	15.038	15	15	100.00	09:00:00	11:43:02
t08	48.473	15	15	100.00	09:00:00	12:23:28
t09	47.576	12	12	100.00	09:00:00	12:00:34
t10	18.450	15	15	100.00	09:00:00	11:32:27
t11	21.943	16	16	100.00	09:00:00	11:44:56
t12	20.886	16	16	100.00	09:00:00	11:54:53
v01	24.625	29	29	100.00	13:00:00	20:40:47
v02	89.732	29	29	100.00	13:00:00	17:52:43
v03	97.577	29	29	100.00	13:00:00	18:05:34
u04	105.544	36	36	100.00	13:00:00	31:03:33

Requests

Turn	Request ID	Details	Amount	Distance Covered	Location ID	Arrival	Service Start	Execution Time	Service End	Earliest Start	Latest Start
0	1001		0	0.000	1001						
1	11031		1	3.081	11031	09:03:04	09:03:04	00:10:00	09:13:04	09:00:00	12:50:00
2	11035		1	0.464	11035	09:13:32	09:13:32	00:10:00	09:23:32	09:00:00	12:50:00
3	11005		1	0.592	11005	09:24:08	09:24:08	00:10:00	09:34:08	09:00:00	12:50:00
4	20005		1	0.906	20005	09:35:02	09:35:02	00:07:00	09:42:02	09:00:00	12:53:00
5	11006		1	2.057	11006	09:44:06	09:44:06	00:10:00	09:54:06	09:00:00	12:50:00
6	11055		1	2.219	11055	09:56:19	09:56:19	00:10:00	10:06:19	09:00:00	12:50:00
7	11072		1	1.052	11072	10:07:22	10:07:22	00:10:00	10:17:22	09:00:00	12:50:00
8	20008		1	3.190	20008	10:20:33	10:20:33	00:07:00	10:27:33	09:00:00	12:53:00
9	10014		1	2.005	10014	10:29:33	10:29:33	00:15:00	10:44:33	09:00:00	12:45:00
10	10029		1	5.479	10029	10:50:02	10:50:02	00:15:00	11:05:02	09:00:00	12:45:00
11	11058		1	5.289	11058	11:10:20	11:10:20	00:10:00	11:20:20	09:00:00	12:50:00
12	1001		0	0.983	1001						

- Cash Distribution & Routing Optimization
- Maintenance team routing



# Workforce Planning Package

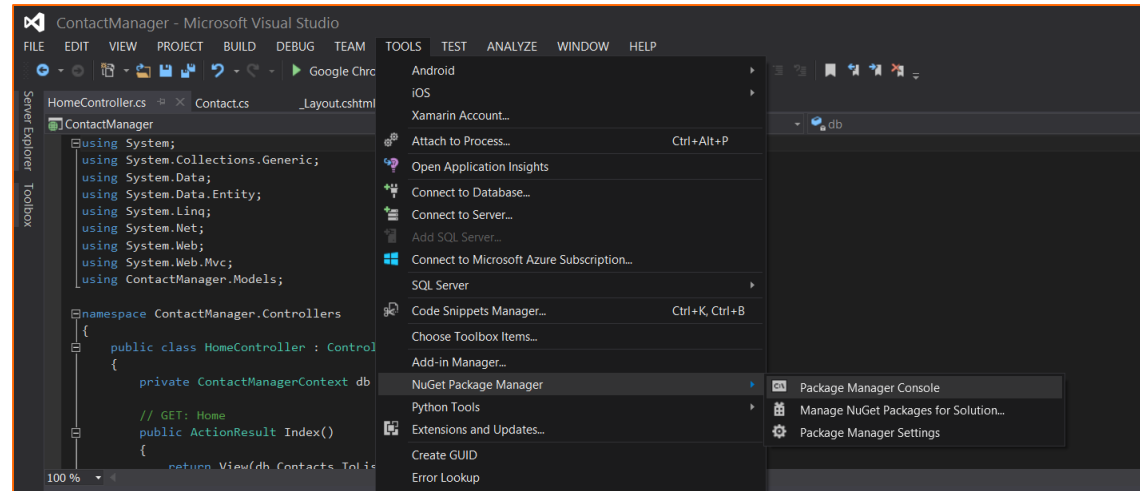
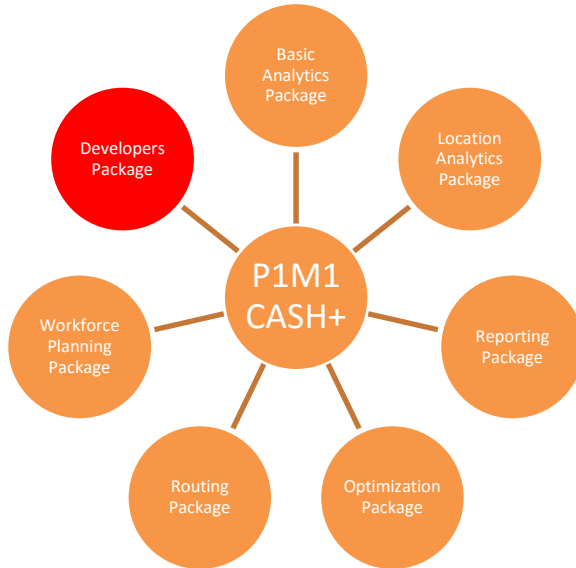


- CIT Workforce optimization
- CIT Workforce simulation





# Developers Package



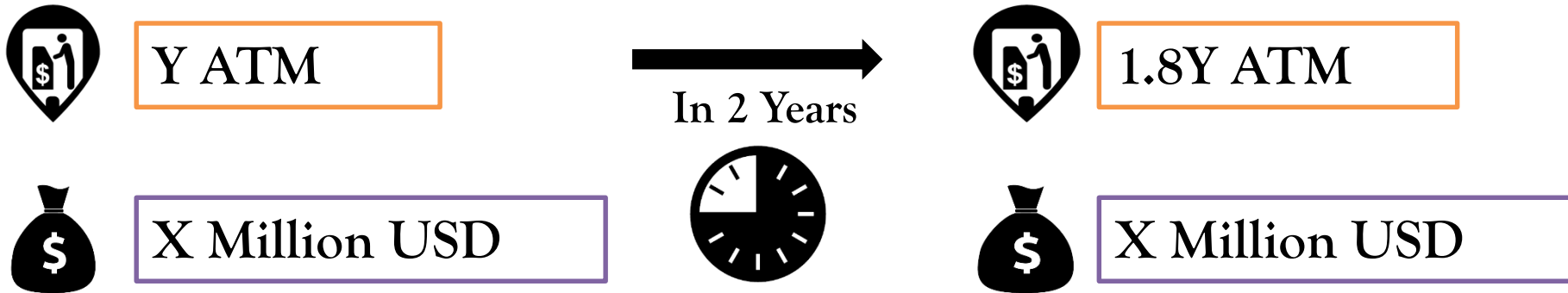
- In-house analytics teams



# CUSTOMER BENEFIT CASE



Almost double amount of ATM on site



Same Amount of Cash on Site





# CUSTOMER BENEFIT CASE



%25 more ATM on site



Y ATM



In 2 Years



1.25Y ATM



X Million USD



0.7X Million USD

%30 decrease in idle Cash



# CUSTOMER BENEFIT CASE



**BNP PARIBAS**

%10 more ATM on site



Y ATM



In 1 Year



1.1Y ATM



X Million USD



0.8X Million USD

Fully automated

42





# REFERENCES





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