MOBILEMONEYOPERATOR
Money Wezesha

August 20
What is MOBILEMONEYOPERATOR Money Wezesha?

Participation initially limited to about 1,250 agents

We analyze individual transaction history to do two things:

1: Recommend how much float and cash to begin the day with:
   • Should help you increase your commission profits
2: Report how much total cash in and cash out you do
   • For each day of the week, what are typical and “high” days

Timing:
• For 1 month, you may receive an SMS from MOBILEMONEYOPERATOR with one or both of these
• After 1 month, you will receive both for a second month
• We will seek your feedback & analyze the data to determine how to proceed
Agenda for today

• Answer questions on paper
• Walk-through cash and efloat inventory scenarios
  {Break}
• Discuss profits, revenues, costs, and “cost of capital”
• Example: Subscriber customers are random
  {Break}
• Discuss how to make cash and efloat decisions
• Describe the cash and efloat recommendations some of you will receive
• Describe the cash in and cash out Information some of you will receive
Questionnaire

Please take 20 minutes to fill out the questionnaire
Example: Three subscribers arrive during the day

- Three customers arrive at an agent throughout the day

  James
  10000 cash out

  Mary
  15000 cash in

  Johnson
  25000 cash out

- Pretend you know these customers are coming, and who will be first second and third to arrive

- How much float do you need? How much cash do you need?
Scenario 1: James, Mary, Johnson
Scenario 1: James, Mary, Johnson

- **James**: Cash Out
- **Mary**: Cash In
- **Johnson**: Cash Out

Up arrow means “Cash In”
Down arrow means “Cash Out”
Scenario 1: James, Mary, Johnson

Length of arrow is how much money.

Each line is 5000Tsh

Johnson’s arrow is “down” and 5 lines long. A 25000Tsh cash out.
Scenario 1: James, Mary, Johnson

- **James**: 10000 Cash Out
- **Mary**: 15000 Cash In
- **Johnson**: 25000 Cash Out
How much float/cash/total budget do you need?

Scenario 1: James, Mary, Johnson

- James 10000 Cash Out
- Mary 15000 Cash In
- Johnson 25000 Cash Out
Scenario 1: James, Mary, Johnson

Cash Flow Diagram:

- **Cash Out:**
  - James
  - Johnson: Need 10000 + 25000 = 35000 (Cash)

- **Cash In:**
  - Mary
  - Float: Need 15000

Total Budget: 50000

Wrong Answer:

- Incorrect calculation or interpretation.
Scenario 1: James, Mary, Johnson

(James: 10000 cash out)
Scenario 1: James, Mary, Johnson

Start with:
5000 float
20000 cash
End:

(James: 10000 cash out)
Scenario 1: James, Mary, Johnson

Start with:
5000 float
20000 cash
End:

This is the amount the agent needs in cash and float. We will show you why and how to calculate this.

(James: 10000 cash out)
Scenario 1: James, Mary, Johnson

Start with:
5000 float
20000 cash
End:
15000 float
10000 cash

(James: 10000 cash out)
Scenario 1: James, Mary, Johnson

Start with:
5000 float
20000 cash
End:
15000 float
10000 cash

(Crystal: 10000 cash out)

This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

- **Start with:**
  - 5000 float
  - 20000 cash
- **End:**
  - 15000 float
  - 10000 cash

- **James:** 10000 cash out
- **Mary:** 15000 cash in

**Right Answer**

This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

- **Start with:**
  - 5000 float
  - 20000 cash
- **End:**
  - 15000 float
  - 10000 cash

Mary: 15000 cash in
James: 10000 cash out

This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

Start with:
- 5000 float
- 20000 cash

End:
- 15000 float
- 10000 cash

This line is how much cash you need as of now: 10000

(James: 10000 cash out)

(Mary: 15000 cash in)

Right Answer
Scenario 1: James, Mary, Johnson

Start with:
- 5000 float
- 20000 cash
End:
- 15000 float
- 10000 cash

James: 10000 cash out

Mary: 15000 cash in

You can line up the start of the next arrow with the tip of the previous arrow.

This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

Start with:
- James: 5000 float
- Mary: 20000 cash

End:
- James: 15000 float
- Mary: 10000 cash

This line is how much cash you need as of now: 10000

James: 10000 cash out

Mary: 15000 cash in
Scenario 1: James, Mary, Johnson

- **James:**
  - Start with: 5000 float, 20000 cash
  - End: 15000 float, 10000 cash

- **Mary:**
  - Start with: 15000 float, 10000 cash
  - End: 0 float, 25000 cash

This line is how much cash you need as of now: 10000

- **James:** 10000 cash out
- **Mary:** 15000 cash in
Scenario 1: James, Mary, Johnson

Start with: 5000 float
20000 cash
End: 15000 float
10000 cash

Start with: 15000 float
10000 cash
End: 0 float
25000 cash

(Cash Out)
James: 10000 cash out

(Mary: 15000 cash in)

This line is how much float you need as of now: 5000
This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

CASH IN

- Start with: 5000 float
  20000 cash
- End: 15000 float
  10000 cash

CASH OUT

- (James: 10000 cash out)
- (Mary: 15000 cash in)
- (Johnson: 25000 cash out)

Right Answer

This line is how much float you need as of now: 5000
This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

Right Answer

- Start with: 5000 float, 20000 cash
- End: 15000 float, 10000 cash

- Start with: 15000 float, 10000 cash
- End: 0 float, 25000 cash

This line is how much float you need as of now: 5000

James: 10000 cash out
Mary: 15000 cash in
Johnson: 25000 cash out

This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

Right Answer

Start with:
5000 float
20000 cash
End:
15000 float
10000 cash

Start with:
15000 float
10000 cash
End:
0 float
25000 cash

Start with:
0 float
25000 cash
End:

This line is how much float you need as of now: 5000

James: 10000 cash out

Mary: 15000 cash in

Johnson: 25000 cash out

This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

**Right Answer**

- **Start with:**
  - James: 5000 float 20000 cash
  - Mary: 15000 float 10000 cash
  - Johnson: 0 float 25000 cash

- **End:**
  - James: 15000 float 10000 cash
  - Mary: 0 float 25000 cash
  - Johnson: 25000 float 0 cash

This line is how much float you need as of now: 5000

James: 10000 cash out

Mary: 15000 cash in

Johnson: 25000 cash out

This line is how much cash you need as of now: 10000
Scenario 1: James, Mary, Johnson

**Right Answer**

- **James:**
  - Start with: 5000 float, 20000 cash
  - End: 15000 float, 10000 cash
  - Cash out: 10000

- **Mary:**
  - Start with: 15000 float, 10000 cash
  - End: 0 float, 25000 cash
  - Cash in: 15000

- **Johnson:**
  - Start with: 0 float, 25000 cash
  - End: 25000 float, 0 cash
  - Cash out: 25000

- This line is how much float you need as of now: 5000
- This line is how much cash you need as of now: 20000
Scenario 1: James, Mary, Johnson

If you start with 5000 float and 20000 cash, you can handle all 3 subscribers. This requires a total budget of 25000. This is less than the 50000 we calculated earlier.

This line is how much **float** you need as of now: 5000

This line is how much cash you need as of now: 20000
Scenario 1: James, Mary, Johnson

You can line up the start of the next arrow with the tip of the previous arrow.
Scenario 1: James, Mary, Johnson

You can line up the start of the next arrow with the tip of the previous arrow.
Scenario 1: James, Mary, Johnson

After you line the arrows up in this way, the highest point (not lower than zero) that the arrows touch is how much float you need. 5000
Scenario 1: James, Mary, Johnson

After you line the arrows up in this way, the highest point (not lower than zero) that the arrows touch is how much float you need. 5000.

The lowest point (not bigger than zero) that the arrows touch is how much cash you need. 20000.
Scenario 1: James, Mary, Johnson

The alternating cash in and cash outs means that you can perform many transactions with a small budget.
Scenario 2: James, Johnson, Mary
Scenario 2: James, Johnson, Mary
Scenario 2: James, Johnson, Mary

(James: 10000 cash out)
Scenario 2: James, Johnson, Mary

This line is how much cash you need as of now: 10000

(James: 10000 cash out)
Scenario 2: James, Johnson, Mary

This line is how much cash you need as of now: 10000

(James: 10000 cash out)

(Johnson: 25000 cash out)
Scenario 2: James, Johnson, Mary

- James: 10,000 cash out
- Johnson: 25,000 cash out

This line is how much cash you need as of now: 10,000
Scenario 2: James, Johnson, Mary

This line is how much cash you need as of now: 10000

(James: 10000 cash out)

(Johnson: 25000 cash out)
Scenario 2: James, Johnson, Mary

This line is how much cash you need as of now: 10000

(James: 10000 cash out)

(Johnson: 25000 cash out)
Scenario 2: James, Johnson, Mary

This line is how much cash you need as of now: 35000

(James: 10000 cash out)

(Johnson: 25000 cash out)
Scenario 2: James, Johnson, Mary

- James: 10000 cash out
- Johnson: 25000 cash out
- Mary: 15000 cash in

This line is how much cash you need as of now: 35000
Scenario 2: James, Johnson, Mary

This line is how much cash you need as of now: 35000
Scenario 2: James, Johnson, Mary

This line is how much cash you need as of now: 35000

James: 10000 cash out
Johnson: 25000 cash out
Mary: 15000 cash in
Scenario 2: James, Johnson, Mary

- James: 10000 cash out
- Johnson: 25000 cash out
- Mary: 15000 cash in

This line is how much **float** you need as of now: 0. You never need less than zero float.

This line is how much cash you need as of now: 35000
Scenario 2: James, Johnson, Mary

If you start with 0 float and 35000 cash, you can handle all 3 subscribers. This requires a total budget of 35000.
Note you will end with 15000 cash and 20000 float. This is less than the 50000 we calculated earlier and more than the 25000. Order of customer arrivals matters!

(James: 10000 cash out)
(Mary: 15000 cash in)
(Johnson: 25000 cash out)
Scenario 3: Mary, James, Johnson
Scenario 3: Mary, James, Johnson
Scenario 3: Mary, James, Johnson

Please take 15 minutes to figure out how much float and cash the agent needs to handle these three customers in this order.
Scenario 3: Mary, James, Johnson

This line is how much float you need as of now: 15000

This line is how much cash you need as of now: 20000
Right Answer

Scenario 3: Mary, James, Johnson

If you start with 15000 float and 20000 cash, you can handle all 3 subscribers. This requires a total budget of 35000 also. Note you will end with 35000 float and zero cash. This is the same budget as scenario 2, but the ratio of cash to float is different.

This line is how much float you need as of now: 15000

This line is how much cash you need as of now: 20000
Question 1: Which do you need a bigger budget for? How much cash/float for each?

Option A:
- 10000 Cash in
- 10000 Cash out
- 10000 Cash in
- 10000 Cash out
- 10000 Cash in
- 10000 Cash out
- 10000 Cash in
- 10000 Cash out

Option B:
- 10000 Cash in
- 10000 Cash in
- 10000 Cash in
- 10000 Cash out
- 10000 Cash in
- 10000 Cash out
- 10000 Cash out
Question 1: Answer

Option A

Need 10000 float

Need zero cash
Question 1: Answer

Option B
Question 1: Answer

- You need 10000 float and zero cash for option A
- You need 30000 float and zero cash for option B
- Answer: You need more budget for option B
Question 2: Which do you need a bigger budget for? How much cash/float for each?

Option A:
10000 Cash in
10000 Cash in
10000 Cash out
10000 Cash in
10000 Cash in
10000 Cash out
10000 Cash in
10000 Cash out
10000 Cash in
10000 Cash out

Option B:
10000 Cash out
10000 Cash out
10000 Cash in
10000 Cash in
10000 Cash out
10000 Cash out
10000 Cash in
10000 Cash in
10000 Cash out
10000 Cash in
10000 Cash in
Question 2: Answer

Option A

Need 40000 float

Need zero cash
Question 2: Answer

Option B

Need 0 float

Need 20000 cash
Question 2: Answer

• You need 40000 float and zero cash for option A
• You need 0 float and 20000 cash for option B
• Answer: You need more budget for option A
Key lessons

• In general, if you know exactly which customers will arrive when, you do not need as much cash/float as the total volume of transactions

• The order of customer arrivals matters
  • If customers alternate cash in/cash out, you need a smaller budget than if all cash ins or all cash outs happen at once

• The balance of cash in and cash outs matters
  • If you have equal cash ins and cash outs you need a smaller budget than if you have more cash ins than cash outs or more cash outs than cash ins
Profits

• **Revenue**: Your total commissions on cash ins and cash outs

• **Costs**: Your cost of doing business... all the money you spend

• **Profit**: Revenue minus your costs. You want to make as much profit as possible by increasing revenues and decreasing costs.

• Example: You earn 10000Tsh.
  You have costs of 7000Tsh.
  Your profit is 3000Tsh. (10000 − 7000)
Cost of capital

• It is more expensive to have 2000000 float and cash than 100 float and cash.

• The 2000000 in the first example may come from several places:
  • You earn it after saving for it
  • You borrow from a formal financial institution like a bank
  • If you pay 20% interest per year to borrow this money, that is your “cost of capital”

• Also, if you have 2000000Tsh, you must decide whether to invest in mobile money or invest in another business or put it in the bank.
  • If you could earn 20% per year by lending 2000000Tsh to a friend, but you decide to invest in your mobile money business instead, this is also a 20% cost of capital.

• The “cost of capital” is your cost of investing more money into your business in higher float and cash amounts
Increasing cost of capital

Budget
- You start each day with 200000 float and 200000 cash
- You decide to have 400000 float and 100000 cash
- You need 100000 extra

Cost of Capital
- You borrow 100000 from a friend who charges 384Tsh per week
- If you earn more than 384 per week in commissions, you make profit
- 384Tsh per week is $384 / 100000 = 0.00384$ portion per week
- $0.00384$ portion per week is $0.00384 * 52 = 0.20$ per year, or 20%
## Decreasing cost of capital

### Budget
- You start each day with 200000 float and 200000 cash
- You want to have 300000 float and 50000 cash
- You have 50000 extra

### Cost of Capital
- You lend 50000 to a friend who gives you 192Tsh per week
- If reducing your budget by 50000 does not reduce your commissions by more than 192 per week, you make profit
- 192Tsh per week is $192 / 50000 = 0.00384$ portion per week
- $0.00384$ portion per week is $0.00384 * 52 = 0.20$ per year, or 20%
Example: Subscriber customers are random

• On three different days, pretend you have either:
  • 100 cash in only
  • 2300 cash in only
  • 3000 cash in only

• You do not know what kind of day in advance. It is equally likely to be any of the three types of days

• You must rebalance at dawn before knowing, and rebalance to the same amount each day.
Example: Facts

• The average cash in day is \( (100 + 2300 + 3000) / 3 = 1800 \text{ cash in} \)

• Pretend your cash-in commission rate is 5%
  • 100 cash in earns 5Tsh commission
  • 2300 cash in earns 115Tsh commission
  • 3000 cash in earns 150Tsh commission

• Pretend you borrow money each day and pay interest at 2% per day
  • 100 loan costs you 2Tsh per day
  • 1800 loan costs you 36Tsh per day
  • 2300 loan costs you 46Tsh per day
  • 3000 loan costs you 60Tsh per day
  • (We call this “cost of capital.” Your personal cost of capital may be different.)
Example: Assumptions

• You pay interest (cost of capital) on whatever float you carry, even if you do not use all of it

• You can serve customers only if you have the float available
  • If you have 1000 float and a customer wants to do 1500 cash in, you can perform only a 1000 cash in and you will not earn commission on the remaining 500. The customer will go to another agent to do the 500 cash in.

• You rebalance every morning to the same amount
### Scenario 1: You stock “average” 1800 float

<table>
<thead>
<tr>
<th>Day</th>
<th>Total cash In that arrives</th>
<th>Total cash in that you can handle</th>
<th>Costs: Cost of capital interest payments</th>
<th>Commision earned</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>100</td>
<td>100</td>
<td>36</td>
<td>5</td>
<td>-31</td>
</tr>
<tr>
<td>Day 2</td>
<td>2300</td>
<td>1800</td>
<td>36</td>
<td>90</td>
<td>54</td>
</tr>
<tr>
<td>Day 3</td>
<td>3000</td>
<td>1800</td>
<td>36</td>
<td>90</td>
<td>54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>77</strong></td>
</tr>
</tbody>
</table>

| **Total** | **108** | **185** | **77** |
Scenario 1: You stock “average” 1800 float

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</tr>
<tr>
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<td></td>
<td></td>
<td><strong>108</strong></td>
<td><strong>185</strong></td>
<td><strong>77</strong></td>
</tr>
</tbody>
</table>

On day 2, when customers want to do 2300 cash in business, you can handle only 1800.
Scenario 1: You stock “average” 1800 float

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<td>54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>185</strong></td>
<td><strong>77</strong></td>
<td><strong>185</strong></td>
<td><strong>77</strong></td>
<td></td>
</tr>
</tbody>
</table>

The interest payments are the same each day because you have 1800 float each day no matter which customers show up.
Scenario 1: You stock “average” 1800 float

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<td>1800</td>
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<tr>
<td>Total</td>
<td>108</td>
<td>85</td>
<td></td>
<td></td>
<td>77</td>
</tr>
</tbody>
</table>

The commission earned is from the total cash in you can handle.
Scenario 1: You stock “average” 1800 float

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<td></td>
<td></td>
<td>108</td>
<td>185</td>
<td>77</td>
</tr>
</tbody>
</table>

5 – 36 = -31
90 – 36 = 54
90 – 36 = 54

Your profit is “commission minus costs”
Note that you lose profit on day 1. However, on the other days your profit more than makes up for this loss on day 1.
Scenario 2: You stock “max” 3000 float

<table>
<thead>
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<th>Costs: Cost of capital interest payments</th>
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<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>180</td>
<td>270</td>
</tr>
</tbody>
</table>
Scenario 3: You stock 2300 float

Please take 15 minutes to try to calculate the profit and answer these questions

1. Will you earn more or less commission than holding 3000?
2. Will you earn more or less commission than holding 1800?
3. Will it cost you more or less cost of capital than holding 3000?
4. Will it cost you more or less cost of capital than holding 1800?
5. Will you earn more or less profit than holding 3000?
6. Will you earn more or less profit than holding 1800?
Scenario 3: **Answer**

<table>
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<td>Day 1</td>
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<td></td>
<td></td>
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<td><strong>138</strong></td>
<td><strong>235</strong></td>
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</table>
All scenarios: Compare

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Float to hold</th>
<th>Total Costs</th>
<th>Total Revenue</th>
<th>Total Profits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>1800</td>
<td>108</td>
<td>185</td>
<td>77</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>3000</td>
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<td>2300</td>
<td>138</td>
<td>235</td>
<td>97</td>
</tr>
</tbody>
</table>

- Scenario 2 has the most revenue, but **not** the most profit
  - It also has the highest costs
- You can make **less** profit by holding *too little* or *too much* float and cash
- This example is not real and not perfect for you. Your own best decision will be based on your customers and your cost of capital
What you should do as an agent

• The best float and cash levels are affected by two key things:

**Canceling out:**
• Cash-ins cancel with cash-outs, so that you may need to stock less than the total volume of transactions you perform
• If you have more cash-ins or cash-outs and are not balanced, you may need more budget
• If you are about to have a lot of cash-ins and then a lot of cash-outs later, you want to start with a lot of float.
• If you are about to have a lot of cash-outs and then a lot of cash-ins later, you want to start with a lot of cash.

**Randomness:**
• You may want to have more cash and float than a typical business day if your commission is more than your cost of capital. In this way, you will have enough float or cash to handle the “high” days
Things it is helpful to know

• Customer patterns:
  • How many customers per day?
  • How many cash-ins vs. cash-outs?
  • Randomness: what is a typical day and what is a high day?
  • Time of day patterns: after I rebalance, do I have a long period of cash-ins, cash-outs, or am I balanced?
  • Day-of-week: are some days (Wednesdays vs. Saturdays) busier or more cash-in or more cash-out?

• Profits
  • Commission tables: how much revenue you earn per transaction
  • Cost of capital: can you estimate how much it costs to change your total budget?
MOBILEMONEYOPERATOR Money Wezesha

• You have been selected by MOBILEMONEYOPERATOR to participate in MOBILEMONEYOPERATOR Money Wezesha
• Some of you will receive recommendations
• Some of you will receive information
• Some of you will receive both
• After a few weeks, all of you will receive both recommendations and information
Recommendations: About

• Every day, we will send you a suggestion about how much float and cash to carry
  • This is float and cash for MOBILEMONEYOPERATOR only
  • You may have more cash if you also do Vodacom and Tigo business

• This suggestion is good if you rebalance once per day in the morning
  • If you rebalance every few days you may need more
  • If you rebalance several times per day you may need less

• The suggestions are based on only some transactions you perform
  • Cash ins; Cash outs; Recharges; Merchant Payments
  • (Does not include loans and other categories)

• This suggestion is custom to you
  • We have analyzed your personal past transaction history.
  • Do not share it because it may not be a good suggestion for other people.
Recommendations: How we calculate them

- For each day of the week (Monday, Tuesday, ...), we analyze how much cash or float you would have needed on each previous day based on your history

- We assume you have a 20% cost of capital per year
  - If you borrowed 1000000, you would pay 550Tsh per day interest, for example
  - If your cost of capital is more, you may want to hold less. If your cost of capital is less than this, you may want to hold more

- We try to recommend cash/float numbers that will maximize your profits
  - We balance cost of capital (your costs) with commissions (your revenue)
  - We take into account randomness. On some days you might lose money, on other days you may make money, but on average we believe you will have very good profits.
Recommendations: Example

• “Rebalance recommendation for tomorrow (Tue): 225000Tsh float/180000Tsh cash.”
Information: About

• We analyze your transaction history for each day of the week (Monday, Tuesday, Wednesday, ...)

• We calculate a typical value for total cash in and cash outs that you have performed. This is the “middle” value
  • Week 1 Tuesday you do 1000 cash in 2000 cash out total on that one day.
  • Week 2 Tuesday you do 10000 cash in and 6000 cash out.
  • Week 3 Tuesday you do 5000 cash in and 10000 cash out
  • The “typical” (middle) numbers are 5000 for cash in and 6000 for cash out.

• We calculate a “high” value
  • It is not the maximum value, but it is near the maximum.
  • Technically it’s called the “90th percentile.” That means that based on your history, 9 out of 10 days were below this “high” value and 1 out of 10 days was above this “high” value.
  • If you had cash in totals on the last 10 Tuesdays of 1000, 2000, 3000, 6000, 5000, 10000, 8000, 7000, 9000, 4000, then “9000” is the high value we would report to you.
Information: How to use

• Most of the time, the recommendations we provide would fall somewhere between the typical and high values of the information.

• You may want to have float and cash for MOBILEMONEYOPERATOR that are between these numbers (Not necessarily in the middle. You may want to be closer to one or the other).

• You may want to adjust your float and cash using the information, but customized for things that you know about your business that we do not:
  • Your actual cost of capital
  • Events occurring in your neighborhood
  • Your actual habits of visiting banks and Float Runners
Information: example

• “On a typical Tuesday, you have 143000 cash in and 108000 cash out. On a high Tuesday you have 253000 cash in and 219500 cash out.”
Questions?
End of training survey

Please complete the end of training survey