

EEC 2018

**Personalization and
Product Recommendation**

Dr. Lau Cher Han



DR. LAU CHER HAN

Bachelor of IT (Database)
Master of IT (Research)
Ph.D. in Machine Learning

Co-founder of iStream, LEAD
and UCAN Technologies



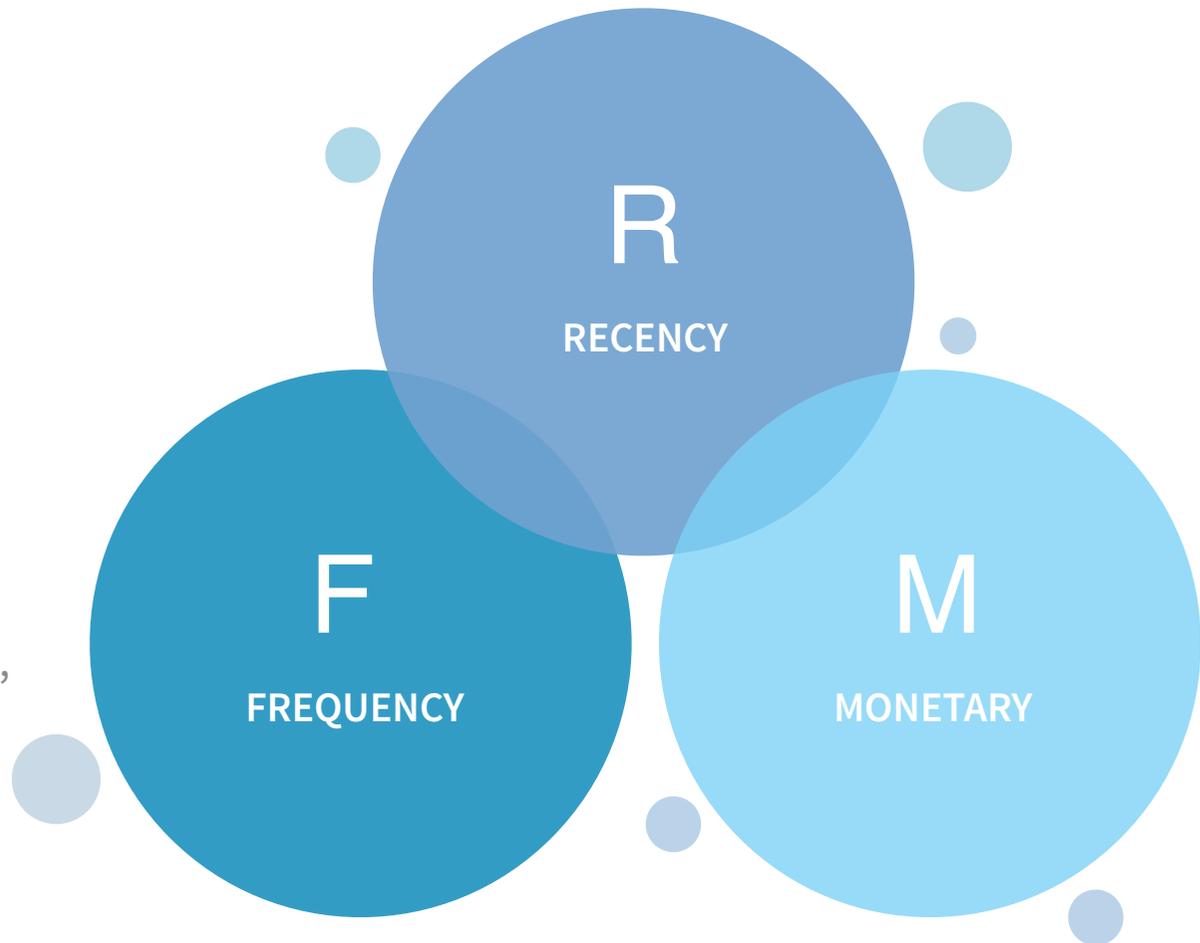
- ✓ Trained data scientists and engineers for **Fusionex, Intel, HP, OCBC**
- ✓ State advisor for **SmartCity and BDA initiatives**
- ✓ Microsoft Excel Expert **World Champion**
- ✓ Worked in **Microsoft e-Research Centre**
- ✓ **HRDF** certified trainer and **MQA Expert Panelist**
- ✓ Founding director of **MaGIC Academy**

CUSTOMER SEGMENTATION

Customer segmentation is the practice of dividing a customer base into groups of individuals that are similar in specific ways relevant to spending habits.

RFM Matrix

RFM stands for *Recency*, *Frequency*, and *Monetary value*. Frequency and monetary value affects a customer's lifetime value, and recency affects retention, a measure of engagement.



RFM METRICS



REGENCY

To measure the freshness of the customer activity such as purchase or visits.

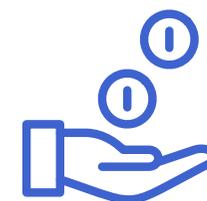
e.g. Time since last order, last engaged product



FREQUENCY

The frequency of the customer transactions or visits

e.g. Total number of transactions



MONETARY

The intention of customer to spend. Purchasing power of customer.

e.g. Total or average transaction value

RFM SEGMENTS

Customer Segment	Recency Score Range	Frequency & Monetary Score Range
Champions	4-5	4-5
Loyal Customers	2-5	3-5
Potential Loyalist	3-5	1-3
Recent Customers	4-5	0-1
Promising	3-4	0-1
Customers Needing Attention	2-3	2-3
About To Sleep	2-3	0-2
At Risk	0-2	2-5
Can't Lose Them	0-1	4-5
Hibernating	1-2	1-2
Lost	0-2	0-2

RFM SEGMENTS

Customer Segment	Activity	Actionable Tip
Champions	Bought recently, buy often and spend the most!	Reward them. Can be early adopters for new products. Will promote your brand.
Loyal Customers	Spend good money with us often. Responsive to promotions.	Upsell higher value products. Ask for reviews. Engage them.
Potential Loyalist	Recent customers, but spent a good amount and bought more than once.	Offer membership / loyalty program, recommend other products.
Recent Customers	Bought most recently, but not often.	Provide on-boarding support, give them early success, start building relationship.
Promising	Recent shoppers, but haven't spent much.	Create brand awareness, offer free trials
Customers Needing Attention	Above average recency, frequency and monetary values. May not have bought very recently though.	Make limited time offers, Recommend based on past purchases. Reactivate them.
About To Sleep	Below average recency, frequency and monetary values. Will lose them if not reactivated.	Share valuable resources, recommend popular products / renewals at discount, reconnect with
At Risk	Spent big money and purchased often. But long time ago. Need to bring them back!	Send personalized emails to reconnect, offer renewals, provide helpful resources.
Can't Lose Them	Made biggest purchases, and often. But haven't returned for a long time.	Win them back via renewals or newer products, don't lose them to competition, talk to them.
Hibernating	Last purchase was long back, low spenders and low number of orders.	Offer other relevant products and special discounts. Recreate brand value.
Lost	Lowest recency, frequency and monetary scores.	Revive interest with reach out campaign, ignore otherwise.

DEMO

Building RFM Profile using Excel

f

fec | 2018

CH DR. LAU CHER HAN

UCAN

SUPPORT

This says how popular an itemset is, as measured by the proportion of transactions in which an itemset appears. In Table 1 below, the support of {apple} is 4 out of 8, or 50%. Itemsets can also contain multiple items. For instance, the support of {apple, beer, rice} is 2 out of 8, or 25%.

$$\text{Support } \{\text{🍎}\} = \frac{4}{8}$$

Transaction 1	🍎 🍺 🍚 🍗
Transaction 2	🍎 🍺 🍚
Transaction 3	🍎 🍺
Transaction 4	🍎 🍏
Transaction 5	🍼 🍺 🍚 🍗
Transaction 6	🍼 🍺 🍚
Transaction 7	🍼 🍺
Transaction 8	🍼 🍏

CONFIDENCE

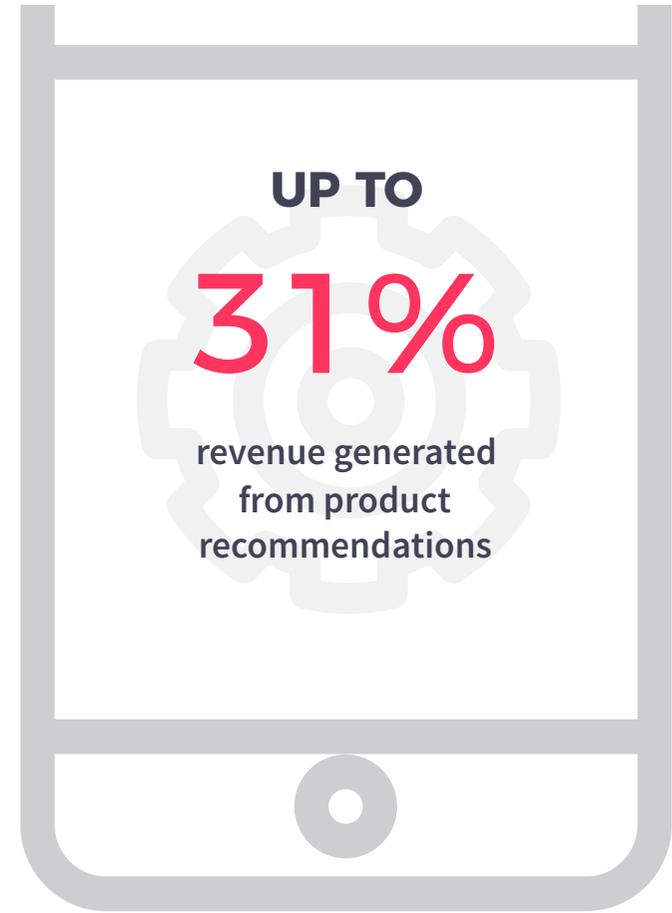
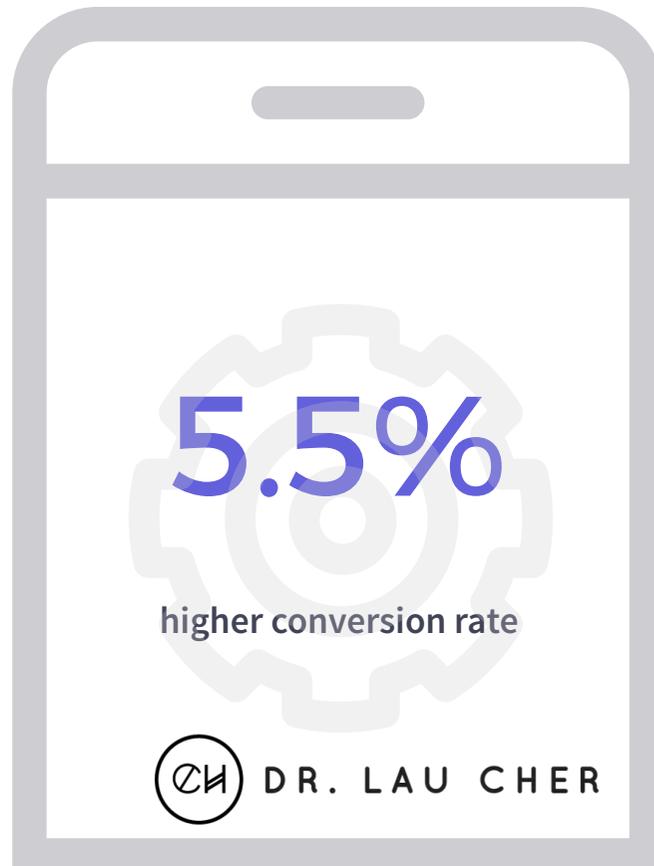
This says how likely item Y is purchased when item X is purchased, expressed as {X -> Y}. This is measured by the proportion of transactions with item X, in which item Y also appears.

In Table 1, the confidence of {apple -> beer} is 3 out of 4, or 75%.

$$\text{Confidence } \{\text{🍎} \rightarrow \text{🍺}\} = \frac{\text{Support } \{\text{🍎, 🍺}\}}{\text{Support } \{\text{🍎}\}}$$

PRODUCT RECOMMENDATION

Including smart product recommendations as part of your user experience can increase the average order value of your conversions.



DEMO

Product Recommendation using Python

f

fec | 2018

CH DR. LAU CHER HAN

UCAN

Q & A ?



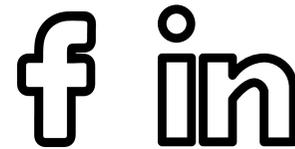
THANK YOU!



<http://www.drhanlau.com>



drlau@cherhan.net



drhanlau