# TigerGraph

# Driving Ecommerce Profits with Personalized Recommendations using Machine Learning and Graph Analytics

April 2021

# About Us

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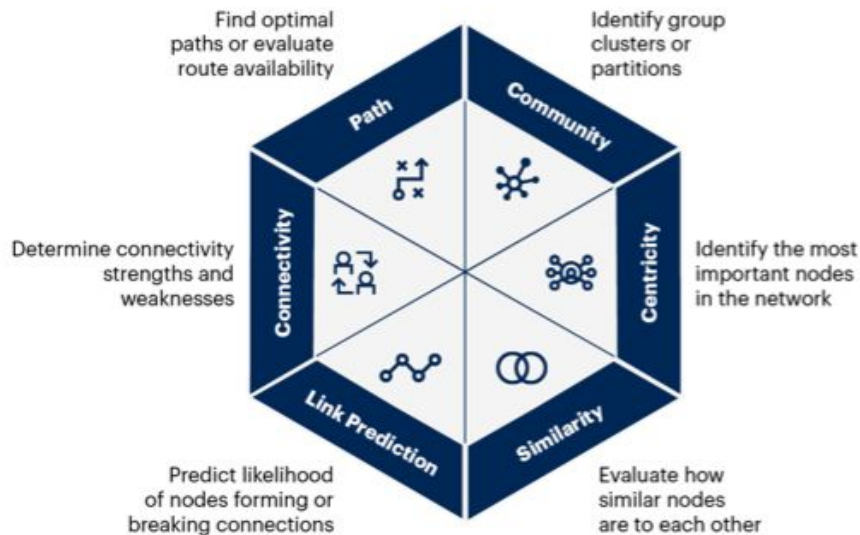
Steven Fuller

Senior Solutions Engineer

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"*Graph analysis is possibly the single most effective competitive differentiator for organizations pursuing data-driven operations and decisions after the design of data capture.*"

**Gartner.**

# Six Types of Graph Analytics

Graph can be used to analyze all sorts of relationships across all kinds of systems even beyond process or beyond the confines of individual operational models.
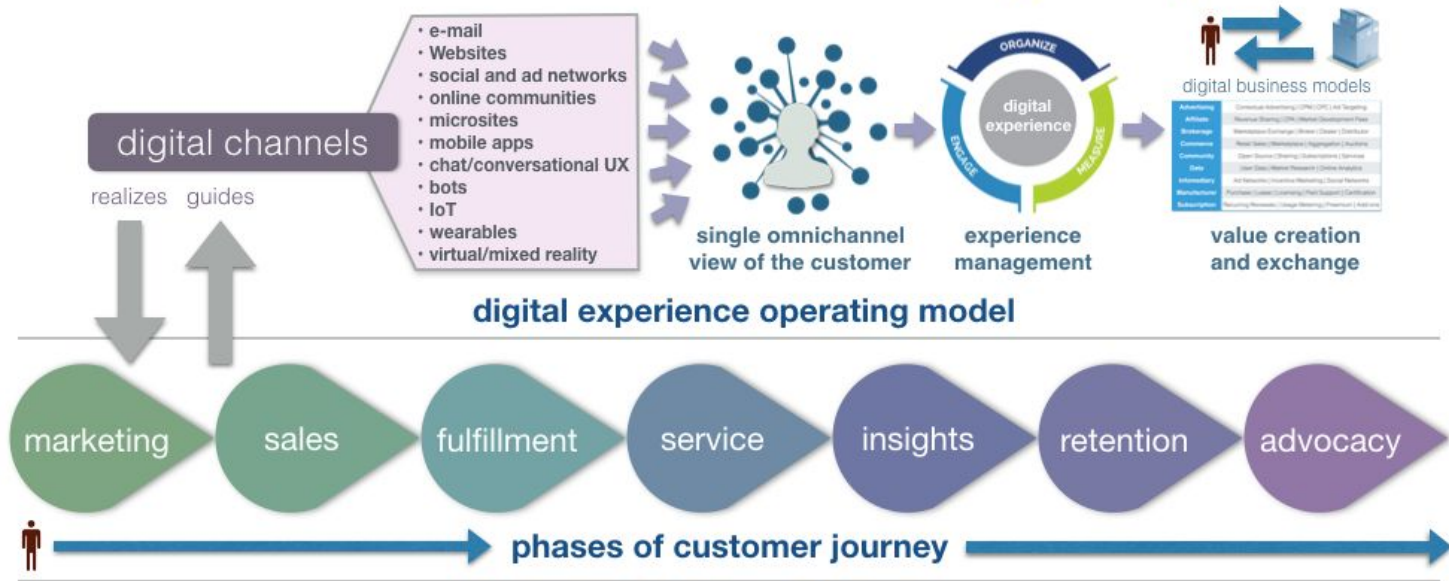
Find optimal paths or evaluate route availability

Identify group clusters or partitions

Path

Community

Determine connectivity strengths and weaknesses

Connectivity

Centricity

Identify the most important nodes in the network

Link Prediction

Similarity

Predict likelihood of nodes forming or breaking connections

Evaluate how similar nodes are to each other

Source: "Understanding When Graph Technologies Are Best for Your Business Use Case", Jim Hare et al, 2020

# Digital transformation begins and ends with the customer

"Customer experience (CX) is the product of an interaction between an organization and a customer over the duration of their relationship.  This interaction is made up of three parts; the customer journey, the brand interactions, and the channels the customer uses to discover an organization's products and services, and purchase behaviors."
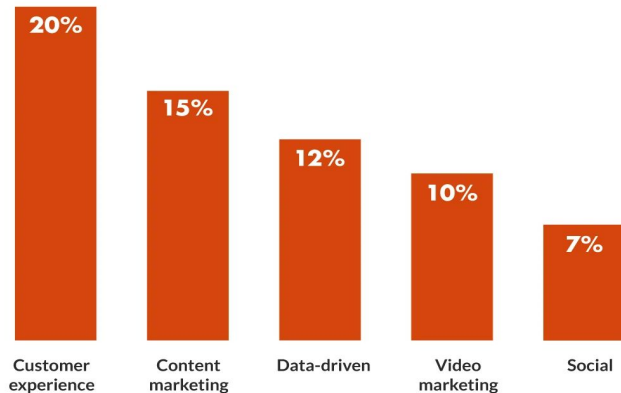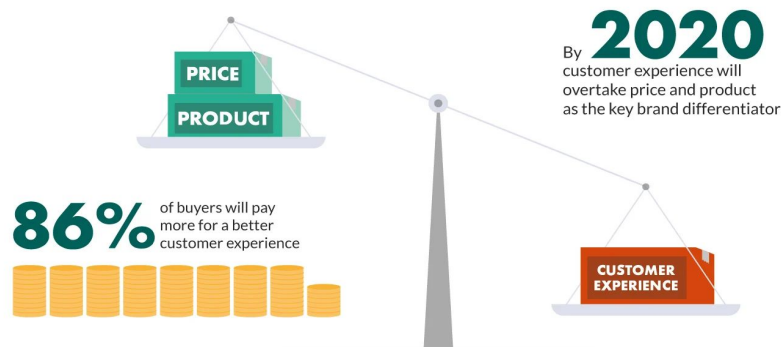
# Next-Generation Customer Experiences



digital channels
realizes  guides

- e-mail
- Websites
- social and ad networks
- online communities
- microsites
- mobile apps
- chat/conversational UX
- bots
- IoT
- wearables
- virtual/mixed reality

single omnichannel
view of the customer

ORGANIZE
digital experience
ENGAGE  MEASURE

experience
management

digital business models

value creation
and exchange

**digital experience operating model**

marketing    sales    fulfillment    service    insights    retention    advocacy

**phases of customer journey**

From http://zdnet.com/blog/hinchcliffe on ZDNet. by Dion Hinchcliffe

# Customer Experience Trends

## MOST EXCITING BUSINESS OPPORTUNITY



Bar chart:
- Customer experience: 20%
- Content marketing: 15%
- Data-driven: 12%
- Video marketing: 10%
- Social: 7%

## SURVEY SAYS: CUSTOMERS HIGHLY VALUE GREAT CUSTOMER EXPERIENCES



By **2020** customer experience will overtake price and product as the key brand differentiator

**86%** of buyers will pay more for a better customer experience

PRICE

PRODUCT

CUSTOMER EXPERIENCE

# It's All About the Journey

- How do we identify the shopping stage for a person and/or groups

- What are the interaction patterns for shopperings during the "Discovery" phase?

- What is the Time-to-Purchase from first visit to purchase?

- What behaviors/patterns cause shoppers to abandon the journey?

- What Marketing activities influence moving from "Discover" to "Choose"?

- What Channels drive the most purchases?

- What are the customer Outbound preferences?
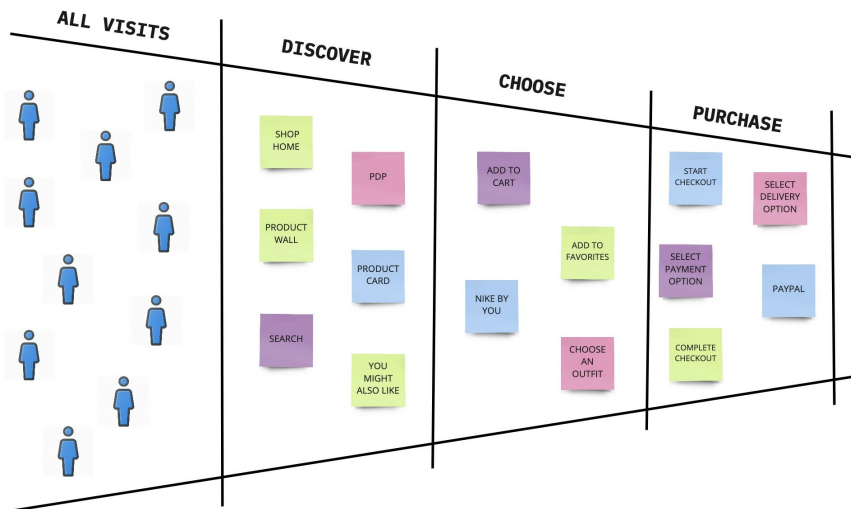
# Customer Journey

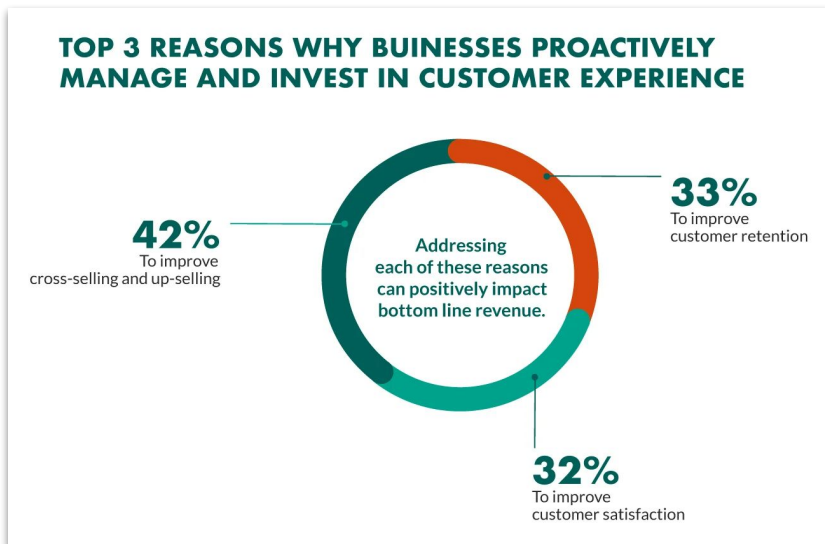# Customer Experience Demonstration

Use Cases

- Customer 360
- Marketing analytics
- Find best customers
- Segmentation / similar customers
- HTAP platform
- Customer journey

# Hybrid Transactional and Analytical Platform

- Upsert data in real-time
- ACID-Compliant
- Post processing
- Immediately available

```
In [8]:    1  ########################################
           2  # Address
           3  ########################################
           4  def gen_address(profile_id,source_id,prfl_date):
           5
           6      idx = random.randrange(1,13655)
           7      geogdata     = df_geo.iloc[idx]
           8      address_id   = int(geogdata[0])
           9      address_type = faker.random_element(elements=('Home', 'Government', 'School', 'Condo', 'Home', 'Apartment', 'Bu
          10      address_line = faker.street_address()
          11      zipcode      = str(geogdata[1])
          12      city         = geogdata[2]
          13      state        = geogdata[4]
          14      lat          = geogdata[9]
          15      lng          = geogdata[10]
          16      market       = geogdata[13]
          17      region       = geogdata[15]
          18      population   = int(geogdata[11])
          19      store_id     = int(geogdata[16])
          20
          21      ### Output Data to CSV
          22      prfl_addr = str(profile_id) + "," + str(source_id) + "," + str(prfl_date) + "," + str(address_id) + "," + str(a
          23      prfl_address.write(prfl_addr)
          24
          25      ### Fill DataFrames
          26      df_address.loc[profile_id]  = [profile_id, source_id, prfl_date, address_id, address_type, address_line, zipcod
          27      df_location.loc[profile_id] = [zipcode, lat, lng, market, region, population, store_id]
          28
          29      ### Upsert to GraphDB
          30      graph.upsertVertex(vertexType='Address', vertexId=address_id,attributes={'address_type':address_type,'address_l
          31      graph.upsertEdge(sourceVertexType='Profile', sourceVertexId=profile_id,edgeType='profile_address', targetVertex
          32      graph.upsertVertex(vertexType='Location', vertexId=zipcode,
          33                         attributes={'lat':lat,'lng':lng,'market':market,'region':region,'population':population,
          34                                     'store':store_id})
          35      graph.upsertEdge(sourceVertexType='Address', sourceVertexId=address_id,edgeType='address_location', targetVerte
          36      graph.upsertEdge(sourceVertexType='Address', sourceVertexId=address_id,edgeType='address_source', targetVertexT
          37
          38      return (address_id)
```

# Business Impact



**TOP 3 REASONS WHY BUINESSES PROACTIVELY MANAGE AND INVEST IN CUSTOMER EXPERIENCE**

Addressing each of these reasons can positively impact bottom line revenue.

**42%** To improve cross-selling and up-selling

**33%** To improve customer retention

**32%** To improve customer satisfaction

- Improve Cross-Sell and Up-Sell
  - Recommendations
  - Next best action

- Improve Customer Satisfaction
  - Personalization
  - Channel preferences

- Customer Retention
  - Purchase patterns
  - Improved offers
  - Life-time value

# TigerGraph for Customer Experience

**Real-Time Decisioning**

1 Instance decisions for product recommendations, next best action, and follow-up procedures

**Customer Insights**

2 Analytics to understand customer behaviors, patterns, and preferences

**Relationship Data Management**

3 Understand customer segments and groups to help improve customer retention and loyalty management
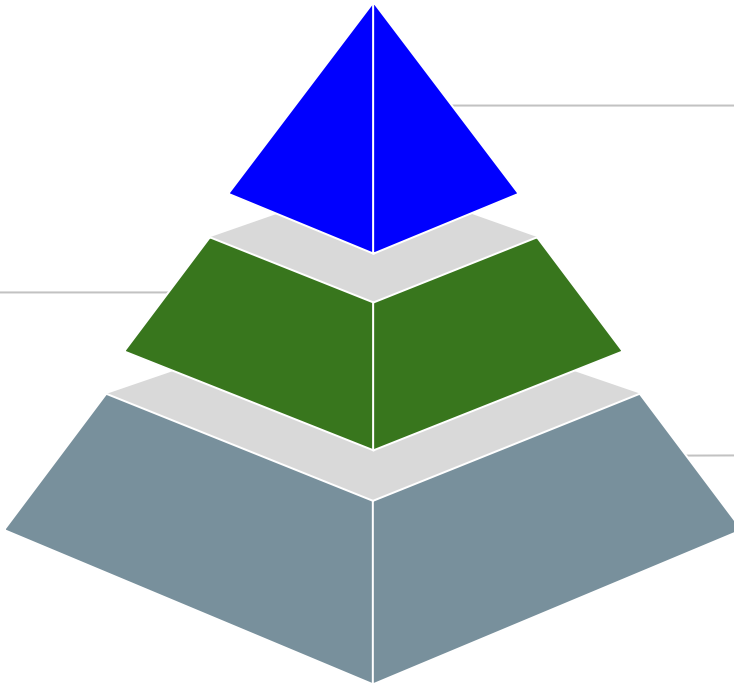
# Business Impact

TigerGraph Accelerators for customer analytics and experience, recommendation use cases, and graph database (sample use cases):

- Customer360
- Marketing Analytics
- Segmentation and Targeting
- Product Recommendations
- Customer Services Preferences
- Community Detection

Includes widgets / visualization / apps for:

- Customer Journey Visualization
- OmniChannel Analytics
- LifeTime Value

Contains foundational components for:

- Native Graph Database and Schemas
- Data Ingestion accelerators for Spark and Kafka
- Graph Algorithms for Machine Learning
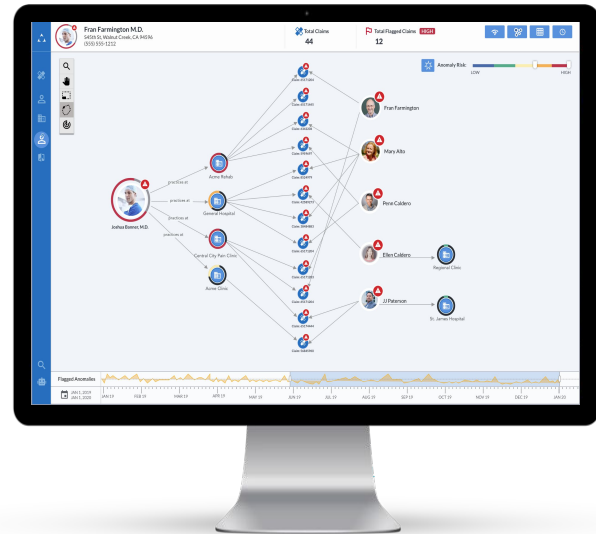
# Thank You



David Ronald

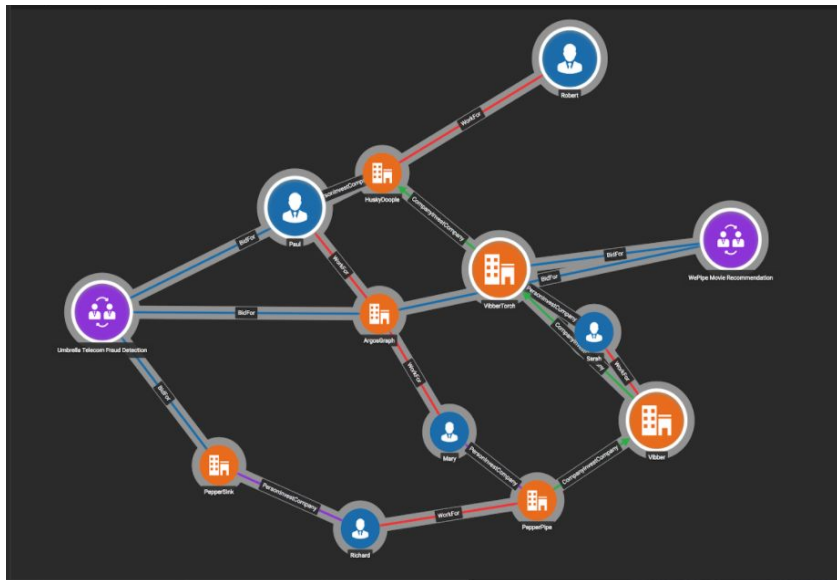Product Marketing Director

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# TigerGraph

# Thank You

# A Sample Graph



Graph databases consist of vertices and edges

- Vertices - data entities
  - for example - person, account, transaction

- Edges - the relationships between those entities
  - for example - person opens account, money moves from one account to another account

A graph stores the relationships between data entities - or can be used to uncover relationships between data entities