WHITE PAPER

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A ROADMAP TO DEVELOP A CUSTOMER ANALYTICS ECOSYSTEM TO WIN IN OMNI-CHANNEL RETAIL

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Introduction

Omni-channel success lies in having a deep understanding of the needs, preferences, habits, and aspirations of the target customers, and in delivering a consistent and memorable brand experience on all available channels. An omni-channel strategy places the customer at the core of retail operations to ensure:

- Customers have the ability to shop and interact on any platform / touch-point, anywhere, anytime, and enjoy a seamless personalized experience and service level.
- A consistent brand presence among customers not only during shopping hours but also during off-purchase hours – pre-purchase decision, actual purchase, purchase delivery, and after-sales period.
- Offline and online channels complement each other so that the customer activities on a channel and across channels, match their requirements.
- Increased customer loyalty, customer lifetime value, and incremental sales.

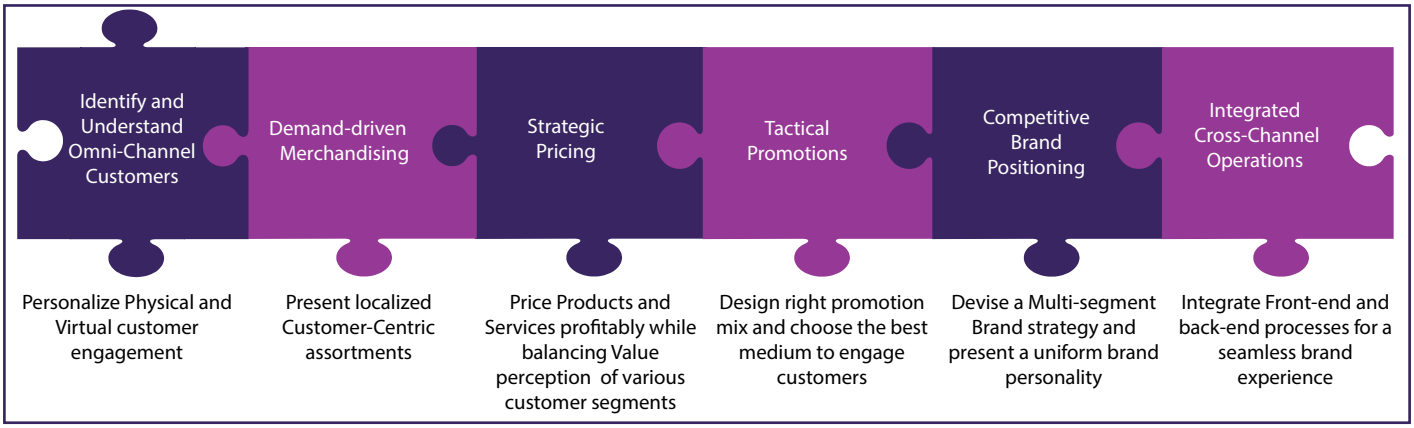
With an objective to instantly gratify the customer, to stay ahead of the competition, and to **'Be quick on the draw'**, omni-channel retailers are developing analytics-based customer insights from the deluge of customer data, to know their customers better and innovate faster than their competitors in their product assortments, pricing, promotions, and branding. (Figure 1). In order to generate meaningful insights and apply these insights in business processes for improving customer experience, a coordinated analytical approach across the customer value chain is required, the data has to be accurate, reliable, secure, and authentic, and the processes and methodologies which churn out data from sources, have to be synchronous.

But developing a co-ordinated analytical approach to business processes and functions comes with challenges such as: enterprises are diverse and exist across geographies with institutional silos, many IT teams are serving several functions, there exist several functional level data marts, tools and methodologies and duplicated analytical initiatives are being developed across the enterprise.

To overcome these challenges and to utilize customer insights for building omni-channel capabilities, we suggest a roadmap to develop an integrated customer analytics ecosystem. An ecosystem that comes with an enterprise-wide approach to customer data management through a shared information agenda, tools, applications, and processes.

Figure 1: Six major strategic goals for omni-channel success

Source: Infosys Research



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- Predicting and shaping customer demand as accurately as possible
- Grouping and clustering stores based on consumer demand
- Formulating an efficient product assortment mix with more variety covering all customer segments across channels
- Localizing product assortments to target customers and local markets
- Right product placements based on consumer decision tree

5

- Attracting customers by brand promise and not through promotions
- Portraying a uniform brand personality across channels through accurate messaging
- Delivering consistent seamless experience across channels
- Establishing right pricing tiers
- Maintaining uniform pricing and optimizing markdowns across channels considering servicing and fulfillment costs.
- Right product placement based on consumer decision tree

1

- Matching customer requirements, value drivers, needs, and preferences with her / his activities across touchpoints
- Tracking analytics across platforms for measuring customer attributes to benchmark against competition
- Analyzing and measuring conversations and sentiments across customer interactions
- Profiling an individual customer and developing a single multi-dimensional view across the enterprise

4

- Design and communicate the right offer to the right customer
- Be relevant – customer, time, product, channel, media

3

- Matching the customer perception of value
- Achieving competitive edge or parity through premium pricing for better margins or accurate discounting for closing sales
- Establishing customer price sensitivity to promoted and non-promoted items
- Establishing the right pricing tiers

6

- Integrating inventory management across multiple channels to achieve enterprise-wide inventory visibility
- Achieving distributed order management across channels and fulfilling demand regardless of origin
- Prioritizing service levels based on customer value
- Establishing a single customer interaction platform to co-ordinate customer returns feedback and complaints across channels
- Integrating customer-facing and back-end systems to enable flow and visibility of customer data across the organization
- Enabling and aligning people, processes, and IT systems to consolidate customer information across all channels and leveraging customer insights across the enterprise

A Roadmap to Develop a Customer Analytics Ecosystem

A robust and flexible multi-dimensional customer analytical ecosystem, which is based on the omni-channel needs of retailers and their customers, is crucial to effectively derive customer-centric insights. Here we propose a logical roadmap that combines industry knowledge, best practices, implementation approaches of past successful projects, and successful experimental proof of concepts to achieve strategic goals. The logical roadmap is as follows:

Step 1 Identify customer analytical opportunities to create value for the customer

We suggest the following methodology to identify and pursue customer analytics opportunities which are crucial for achieving omni-channel strategic goals:

(i) The listed strategic goals of a retail organization can be assigned a weightage based on importance and current strategic direction. The weightage is not, however, to say that one initiative is more important than the other, but rather the weightage establishes the retailer's focus at a given point in time.

(ii) For each of the strategic initiatives, an exhaustive list of customer analytical opportunities can be prepared. Key stakeholders of various functional units can provide their respective list of opportunities, which are important to them.

(iii) Each of the enlisted customer analytical opportunities can be assigned a **Priority Score and Feasibility Score.**

The objective of establishing the priority and the feasibility of analytical opportunities is to ensure that effort and financial resources are not wasted for lack of organization readiness. **Priority score** ensures that the organization invests on those analytical opportunities that are the need of the hour, while the feasibility score prevents discontinuity or staggered progress of projects for dearth of any crucial factors. Analytical projects will be successful only if there is consensus and collaboration between all organizational units.

The business goals and factors being considered for determining the priority and the feasibility of an analytical opportunity for implementation may vary from company through market.

Priority score

Analytical opportunities which are of high-impact to the organization have to be prioritized by considering the following:

- Will anticipation of market conditions, competitor movement, and customer trends be more accurate?
- Will better and faster strategic, tactical, and operational decisions be made?
- Will the decisions help in building a differentiated capability?
- Will the enhanced capabilities lead to innovation or market differentiation?
- Will innovation and differentiation lead to better business results?
- Will the improved analytical capability improve performance standards or build a competitive advantage?

The priority assessment helps establish the level of business benefit expected in alignment with strategic goals.

Each analytical opportunity is assigned a priority score ranging from 1 to 5, on a priority scorecard against the following two aspects:

✓ **What is the value or benefit delivered to the customer?** What is that aspect of a customer's shopping experience that must improve?

✓ **What is the desired business outcome?** What are those aspects of the business which will improve by bettering customer experience?

Figure 3: Sample priority scorecard for an illustrative list of customer analytics opportunities

Source: Infosys Research

Challenges and goals	What is the business outcome or goal?	What is the value or benefit delivered to the customer?	Weightage	Customer analytics opportunity	Priority score	Weighted priority score
Demand-driven assortment optimization	– Incremental product sales and category profitability – Improve sale of mid-high margin products – Reduce stock outs and lost sales – Improve inventory turns or space productivity – Improve variety and depth	– Assured availability of desired product – Improved assortment and variety – Easily locate products – Shop on any channel	30%	Purchase pattern and spend pattern analysis	5	1.5
				Product association and cross-purchase analysis	5	1.5
				Brand preference / product affinity analysis	4	1.2
				Channel affinity and cross-channel purchase analysis	5	1.5
Strategic pricing	– Increase average basket values – Improve customer satisfaction – Sustain customer loyalty – Optimize use of capital or improve profitability – Optimize markdowns	– Perceived value for money – Pleasant cross-channel shopping experience – Improved product availability at desired prices	20%	Cross-channel price preference analysis	4	0.8
				Price elasticity analysis	3	0.6
				Price value mapping	5	1
				Price threshold and sensitivity analysis	5	1
Tactical promotions	– Increase walk-ins and acquire new customers – Expand relevance and response of promotions – Increase product trials and impulse buying – Increase product cross-sell and upsell opportunities – Optimize promotional spend or improve ROI	– Personalized and relevant offers – Improved savings – Easy recognition of benefits – Incentive to upgrade to better products – Purchase additional units at same price	20%	Cross-channel promotion halo and cannibalization analysis	4	0.8
				Promotional behavior analysis	5	1
				Promotional effectiveness analysis	4	0.8
				Cross-channel promotional base and lift analysis	3	0.6
Brand positioning	– Improve customer mindshare – Improve brand equity – Improve brand recall – Attract new customers – Identify new markets	– Euphoria of exclusivity – Perceived high quality – Brand trust and confidence – Uniform brand experience	10%	Brand perception analysis	5	0.5
				Top-of-the-mind brand association analysis	3	0.3
				Brand personality vis-à-vis competitor analysis	2	0.2
				Mind-share analysis	4	0.4
Integrated operations	– Reduce fixed and operational costs – Integrate sourcing and data flow – Responsive supply and demand chain – Improve service levels – Retain customer loyalty – Eliminate cross-channel cannibalization	– Endless aisle shopping experience – Choice of delivery options – Instant gratification – Faster fulfillment and convenience	20%	Cross-channel sales shift analysis	4	0.8
				Channel sales segment analysis	3	0.6
				Customer Return analysis	5	1
				Sales opportunity analysis	2	0.4

Feasibility score

After establishing high-impact opportunities that are critical in achieving strategic goals, analytical opportunities can be assigned a feasibility score based on select parameters. While the parameters for the feasibility assessment may differ from business process through enterprise, some general parameters for consideration are: Is the sponsorship and commitment of business unit leadership ascertained? Is there a budgetary constraint? Is quality data available? Is there a dearth of analysts or lack of skill in the chosen technology?

The feasibility scoring helps conduct a comparative assessment of the level of difficulty that is involved in implementing various analytical opportunities. A feasibility scorecard can be prepared for all identified analytical opportunities.

Figure 4: Sample feasibility scorecard for customer analytics opportunities

Source: Infosys Research

Negative indicators – higher the cost or time taken to implement, lower the feasibility score

Feasibility analysis for analytical opportunities to pursue strategic goals		Analytical opportuntities							
Strategic goal	Strategic pricing	Cross-channel price preference analysis		Cross-channel price-preference analysis		Price elasticity analysis		Price value mapping	
Weightage	20%								
No.	Feasibility assessment parameters	Feasibility score	Weighted feasibility score (weightage x feasibility score)	Feasibility score	Weighted feasibility score (weightage x feasibility score)	Feasibility score	Weighted feasibility score (weightage x feasibility score)	Feasibility score	Weighted feasibility score (weightage x feasibility score)
1	Perceived cost feasibility as per existing budget (-ve) *	Cross-channel price-preference analysis	Cross-channel price-preference analysis	Price elasticity analysis	Promotional behavior analysis	Price value mapping	Price value mapping	Price threshold and sensitivity analysis	Price threshold and sensitivity analysis
2	Omni-channel retail enterprise's processes adaptability	2.0	0.4	3	0.8	5	1	3	0.6
3	Cost-benefit analysis of analytical capability	3.0	0.6	4	0.8	2	0.4	3	0.6
4	Business process owners' acceptability	2.0	0.4	5	0.3	3	0.6	3.5	0.7
5	Cost of training employees (-ve) *	3.0	0.6	2	0.3	3	0.6	3	0.6
6	Time required to materialize the analytics initiative (-ve) *	2.0	0.4	2.5	0.4	3	0.6	2	0.4
7	Availability of technical infrastructure	3.0	0.6	3	0.3	3	0.6	5	1
8	Availability of technical skills	1.0	0.2	2	0.3	5	1	3	0.6
9	Data availability for the analytics initiative	3.5	0.7	3	0.2	2	0.4	1	0.2
Total weighted feasibility score			3.9		3.4		5.2		4.7

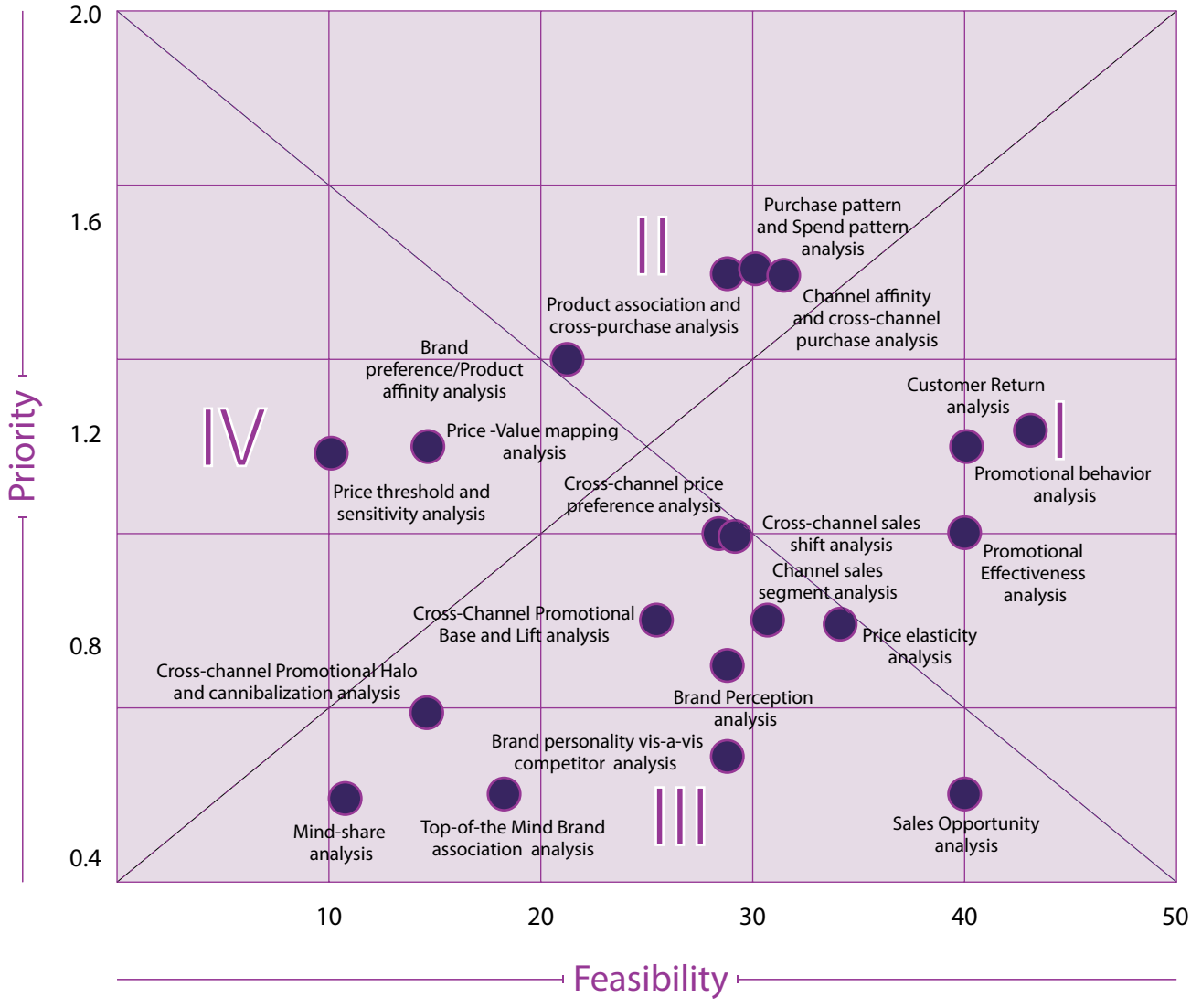
It must be noted that the priority score and the feasibility score will be assigned based on the collective judgment of authorized personnel.

Opportunity selection matrix

After establishing the two scores, the analytical opportunity can be marked on an opportunity selection matrix. The opportunity selection matrix can be used to select customer analytical opportunities for implementation. The priority score and the corresponding feasibility score of each opportunity are hedged to plot the position of the opportunity in the matrix. Opportunities falling into sector I can be immediately selected for implementation, while the opportunities falling into sectors II, III and IV, can be implemented subsequently. Based on the developments in the organization in terms of the operational readiness, technological capability, availability of resources, or change in business priorities, analytical opportunities may occupy different positions in the matrix during the course of time. New analytical opportunities may also get added to the selection list while some existing opportunities could get eliminated.

Figure 5: Sample opportunity selection matrix to select customer analytics opportunities for implementation

Source: Infosys Research



Step 2 Prepare the customer analytics process maturity charter

The next suggested step is to plan and prepare for the implementation, with the help of a process charter. The process charter will help to establish the level of analytical maturity that the organization hopes to achieve in time and also determine the current maturity level.

A sample customer analytics process maturity charter is explained in Figure 6.

The current analytical maturity for each step of the analytical ladder can be ascertained and marked on the charter.

Figure 6: Sample customer analytics process maturity charter (Illustrative)

Source: Infosys Research

Step in the analytical ladder	Maturity area	Current maturity level
1	Ensure accurate, integrated, and relevant data aggregated from demographic, transactional, interactive, and conversational customer data.	
2	Identify key customer segments and most valuable customers and derive precise insights into customer needs, preferences, desires, and aspirations. – Discover patterns, trends, and variances in customer attitudes and activities – Formula hypothesis on factors influencing customer preferences and perceptions – Build statistical relationships on influencer factors to validate the hypothesis	
3	Determine what personalization action has to be taken for individual customers keeping in mind strategic goals and business outcomes (e.g., personalized offers)	
4	Predict how customers are likely to behave in future	
5	Identify opportunities for action or decision-making (assortment, pricing, promotions, branding) which will result in the achievement of determined business goals or targets	
6	Incorporate insights into decision-making for relevant business processes	
7	Optimize processes in real-time (e.g., real-time offers to customers)	

Legend

Step 3 Build the customer analytics ecosystem

a) Select the analytical solution

One of the key goals of an omni-channel retail strategy is providing granular and personalized customer experiences – implementation of in-memory analytics will enable real-time processing of big data. This will help accelerate complex analytical computation, offering new customer insights, and thereby throwing up business opportunities. But as the market offers multiple solutions in multiple architectural segments, the best solution can be selected based on the maturity of data, which can be ascertained in level 1 of the customer analytics process maturity charter (Figure 6).

The following table of guidelines can be used for evaluating the capability of a solution.

Deployment / performance	Data portability / interface	Visualization of insights	Adherence to enterprise standards for data privacy
Load-time and speed of deployment	Easy access to third-party tools and interface	Easy to use, simple, relevant for different categories of users including non-analytical, less-skilled employees	Single sign on and authentication with the right authorization framework around user tasks
Robustness and scalability	Ability to easily fit into transactional systems like ERP, CRM, POS	Ability to provide guided, interactive, and flexible experience to the user to explore multiple dimensions and variables	Applicable encryption capabilities using standards such as SSL
Memory optimization capability	Ability to integrate through a standard interface with an existing data center and security network; and ability to provide a common set of interfaces to entire data residing in the ecosystem	Provide what-if analysis and ability to perform exploratory analysis on entire data	Audit trail capabilities
		Ability to collaborate and distribute findings and queries	Efficient security administration tools
			Ability to perform data masking, meta-tagging, data classification, and micro access control

b) Optimize analytical ecosystem by analyzing key requirements based on volume, variety, and velocity of data

The customer analytics ecosystem should be robust enough to handle new types of data and the increasing volume and velocity of data. The ecosystem should be optimized to handle workloads of complex analytical processing. Integration of analytic relational systems and non-relational systems (e.g., Hadoop) will be crucial to develop a rich and high-performance customer analytics ecosystem. Sensitive and critical data can be isolated from non-sensitive data to establish different security and protection controls. Some of the key requirements for optimizing the customer analytics ecosystem are:

i) Build analytical sandboxes which are scalable to take in new types and different volumes of data.

ii) Ensure that new types of data are analyzed using SQL / NO-SQL with access to external data sources and systems.

iii) Extend analytical functions, customize storage managers and the range of data that can be managed, to improve big data processing capabilities of system.

iv) Query optimizer should be able to map the logical view of data to the underlying physical storage structures used to manage the data.

v) Build a set of interfaces and integrated toolsets for all the data hosted by the ecosystem to facilitate the use of multiple analytical tools and interfaces by users to access and analyze data.

vi) Consolidate key components of the ecosystem into a single system to

provide a single data management and analytical platform.

vii) Build the architecture for parallel processing with quick data transfer between nodes.

viii) Establish and sustain governance and data integrity, confidentiality of sensitive data, and compliance of statutory regulations.

c) Build the analytical model

Once a single version of enterprise data assets is created, the next step is to build an analytical model. Analytical modeling is the most valuable activity in generating key insights to mold a compelling customer analytics ecosystem. Analytical models or equations come in all shapes and sizes – simple model, complex model, reflective model, or predictive model. Any proven analytical technique or a combination of these techniques can be used to arrive at a model. The selection of the technique for modeling depends on the nature of business insight requirements and the availability and maturity of data. It is also important to gather which business users and applications require processing of ad-hoc and non-standard reports.

Figure 7 explains an illustrative set of statistical techniques that can be incorporated into the analytical model for each of the analytical opportunities.

Figure 7: Sample analytical techniques for the identified customer analytics opportunities

NOTE: The techniques below are illustrative only and are subject to change based on the available data and business scenarios.

Source: Infosys Research

Strategic initiative	Analytical opportunity	Statistical techniques
Demand-driven assortment optimization	Purchase pattern and spend pattern analysis	Correlation, regression
	Product association and cross-purchase analysis	Customer value models
	Brand preference / product affinity analysis	Regression, decision tree
	Channel affinity and cross-channel purchase analysis	Regression, decision tree
Strategic pricing	Cross-channel price preference analysis	Regression
	Pricing elasticity analysis	Correlation, regression
	Price value mapping	Lateral class modeling
	Price threshold and sensitivity analysis	Simultaneous equation regression
Tactical promotions	Promotional behavior analysis	Regression, factor analysis
	Promotional effectiveness analytics	Factor analysis, clustering, and classification
	Promotional traffic analysis	Correlation, regression
	Cross-channel promotional base and lift analysis	Rules-based cross- / up-sell models, decision trees
	Cross-channel promotional halo and cannibalization analysis	Correlation, regression, ranking
Competitive brand positioning	Brand perception analysis	Trending and time series analysis
	Top of the mind brand association analysis	Simulations
	Brand personality vis-à-vis competitor analysis	Simulation, regression
	Customer sentiment analysis	Text / Web analytics, ranking / scoring, regression
Integrated cross-channel operations	Cross-channel sales shift analysis	Regression, decision tree
	Channel sales segment analysis	Clustering and Classification
	Customer return analysis	Factor analysis
	Sales opportunity analysis	Correlation, regression, clustering, and classification

Step 4 Embed insights into business operations

Embedding customer insights into business operations helps the organization improve customer-centricity and take quick and relevant decisions for achieving omni-channel goals.

The roadmap to an analytics–driven omni-channel retail operations may involve reengineering current processes or building new business processes enabled by analytics. It is therefore imperative that business process owners and stakeholders are consulted while building, managing, and monitoring the analytical ecosystem.

This can ensure the following wins:

- The right data sets are included in the analytical model
- Assumptions, rules, and algorithms are correct
- Decision methods and results generated are accurate
- Trust among process owners and stakeholders is developed
- Analytics-based decision-making and execution culture is promoted within the organization

Embedding analytics into business processes involves three approaches

a) **Automated decision management:** When high quality of data is available, the nature of knowledge and decision criteria is less dynamic and frequent, and decision-making has to be in real-time with no exceptions; analytics can be embedded into business processes for automated decision making by the system. This is typical of custom-facing operational decisions where human intervention can be time-consuming. For example, based on the total loyalty points accumulated, a loyalty program member can be automatically upgraded from a lower tier to a higher tier.

b) **Analytics recommended manual decision-making:** When the knowledge and decision criteria are less defined and adaptable as in operational and tactical decisions, analytics can provide recommendation to the user through what-if analysis and factoring in key customer metrics. The user takes the decision based on functional expertise and experience. In this approach, parameters have to be laid down clearly to tackle exceptions and override them, with alerts when an exception has been overridden. For example, based on market basket analysis and consumer trends analysis, a merchandise optimization tool can recommend to a buyer the stock keeping units (SKUs) he should buy and rationalize. The buyer can take a decision based on the optimization results provided by the analytics system.

c) **Manual decision-making based on analytics insights:** When the data is less structured and decision criteria is complex with undefined variables, analytical insights can inform business users who will ultimately take the decisions based on the data available. The data can be presented through effective visualization to enable easy and accurate interpretation by the user. In this approach, analytics serves to improve personal productivity, collaboration, and information workflow. For example, based on customer feedback and mystery shopping reports, training on product knowledge, clientelling, selling skills, etc., for select employees can be planned.

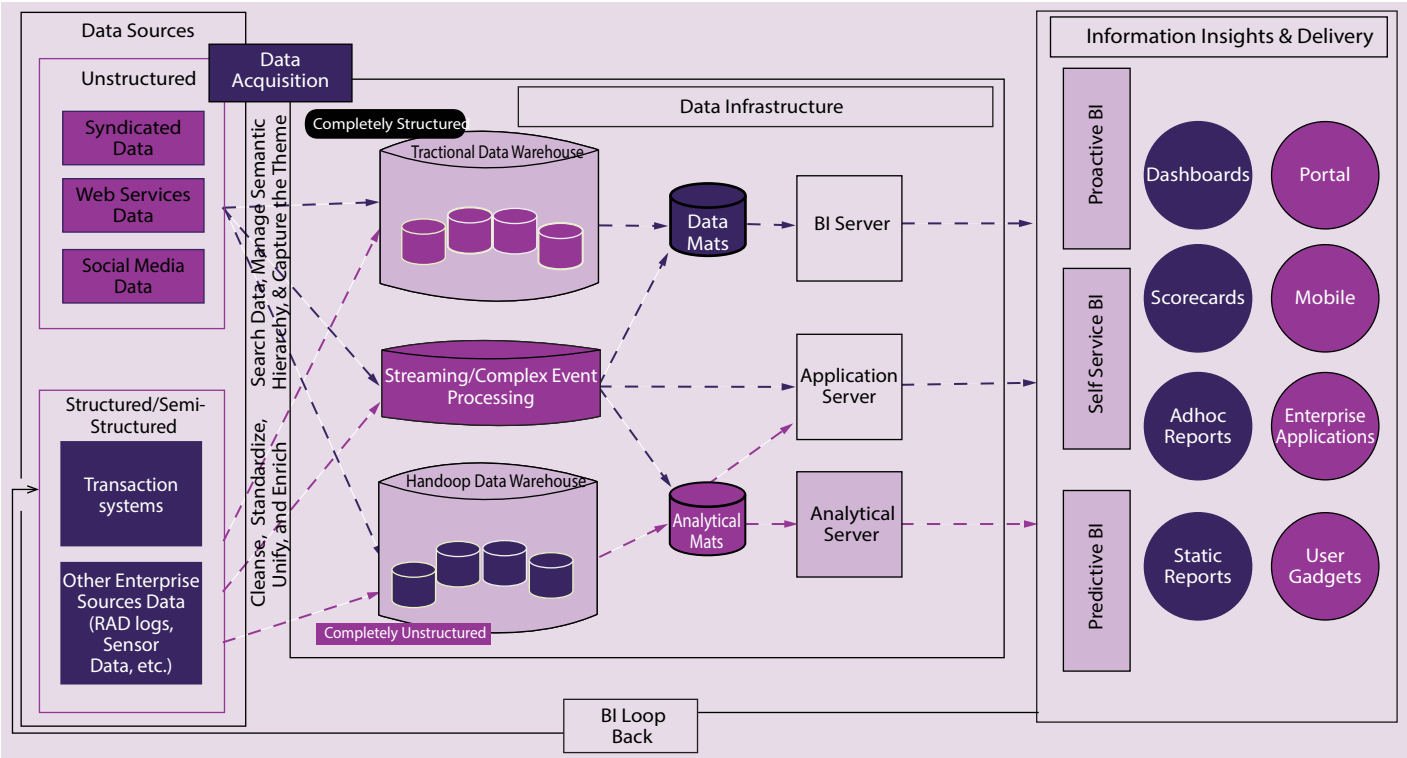
Here are a few recommendations which will warrant successful implementation of analytics in business processes:

- Involve business process owners and stakeholders in developing, managing, and testing the analytics ecosystem.
- Establish an information agenda along with the business process owners and stakeholders that will identify business transformation opportunities and also optimize investment on specific analytical opportunities.
- Frame a decision-making governance and improvement process for each analytical opportunity with analytical decision targets in line with the strategic goals and determine business outcome.
- Simulate the process enabled by analytics (pilot test) to compare against the baseline performance and check the effectiveness and business value created.
- Test on a regular basis if data is accurate and complete or whether the data management methods need overhaul.
- Establish feedback channels and report success against performance metrics.

Figure 8 explains a high-level architecture of a customer analytics ecosystem.

Figure 8: High-level architecture of a customer analytics ecosystem

Source: Infosys Research



Step 5 Measure the effectiveness of the analytics ecosystem

Measuring the effectiveness of the customer analytics ecosystem and the success of embedding the analytics into business processes can be done along two lines:

1. Measure the success

(i) Evaluate whether the desired analytical process maturity has been achieved. If a lag in the desired process maturity is found, identify which aspect in step 3 and step 4 needs to be improved.

(ii) Gauge the adoption of users to evaluate if the adoption of users is staggering the progress in analytical process maturity.

(iii) Measure improvement in business process cycle time, speed in decision-making and the impact of analytics-enabled decision on revenue enhancement, customer metrics, or cost optimization.

(iv) Measure performance against set business goals based on customer-centric metrics such as customer satisfaction score, number of new customers added, customer wallet share, lifetime value, and profitability.

(v) Conduct a financial impact analysis of each analytics-enabled process before and after deployment.

(vi) Review the impact of current performance on long-term omni-channel strategic goals.

2. Review the efficiency

(i) Evaluate the accuracy of data sets through precision and recall testing and analytical model accuracy by cross-validation of sample sets of data and insights.

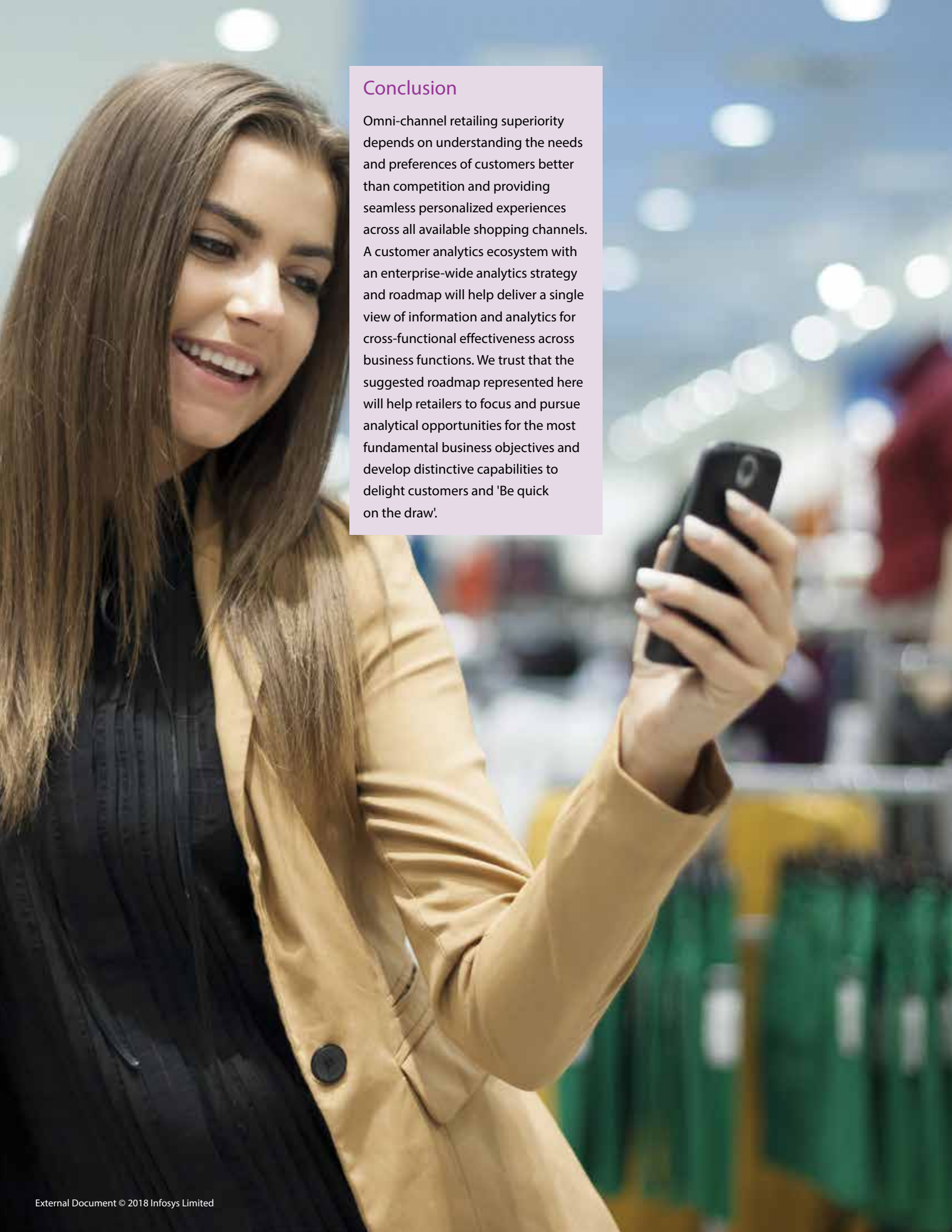
(ii) Compare the accuracy rate of predictions against the actual.

(iii) Measure the error rate.

(iv) Measure incremental ROI gain.

(v) Compare the analytics models used against those used by competitors and new solutions in the market.

(vi) Evaluate alternatives and need for change in analytical capabilities.



Conclusion

Omni-channel retailing superiority depends on understanding the needs and preferences of customers better than competition and providing seamless personalized experiences across all available shopping channels. A customer analytics ecosystem with an enterprise-wide analytics strategy and roadmap will help deliver a single view of information and analytics for cross-functional effectiveness across business functions. We trust that the suggested roadmap represented here will help retailers to focus and pursue analytical opportunities for the most fundamental business objectives and develop distinctive capabilities to delight customers and 'Be quick on the draw'.

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