

SAP Global Study: IoT Adoption in the Consumer Products Industry

Urgently seeking a return to growth, consumer products executives turn to the Internet of Things

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Table of Contents

- 3 Section 1:** Introduction
 - 5 Section 2:** What's driving IoT adoption? Urgent challenges, focused initiatives
 - 6 Section 3:** IoT underpins the highest priority consumer products initiatives
 - 8 Section 4:** Leader-follower analysis: The value proposition of IoT
 - 11 Section 5:** Assessing the path forward for IoT in consumer products
 - 13 Study Demographics**
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List of Figures

Figure 1: Top Business Challenges and Strategic Drivers

Figure 2: Understanding the Full Value of IoT

Figure 3: Planned Areas to Unlock Business Value of IoT

Figure 4: Strategic Drivers: Leader-Follower Analysis (Understanding of IoT)

Figure 5: Strategic Drivers: Leader-Follower Analysis (Understanding of IoT Applicability)

Figure 6: Laying the Foundation for IoT (Leaders)

Figure 7: Demographics

Figure 8: Responding Company Revenue Allocation by Country

Introduction

The consumer products (CP) industry¹ has experienced an impressive run of phenomenal growth, including rapid global expansion and consistent profits. But in the last five years, this growth curve has flattened. Diversification in consumer preferences, proliferation of brand choices and, perhaps most importantly, evolving consumer expectations are largely to blame.

Digital technologies are reshaping shopping behaviors, with mobile, internet-enabled technologies putting consumers in the proverbial driver's seat. With immediate access to myriad information sources, consumers can make sophisticated purchasing decisions by comparing products, pricing, and promotions in real time.

This digital revolution in consumer behavior is compelling CP companies to adopt increasingly sophisticated approaches to understanding shopping patterns. A rich understanding of consumers can potentially impact everything from R&D and manufacturing to supply chain, sales, and marketing.

More recently, the Internet of Things (IoT)² has emerged as a powerful new mechanism to help CP companies more deeply understand the changing consumer landscape. What makes this possible is the ability of IoT to collect and process information in real-time and from myriad devices, machines, and applications. As data is continuously fed into an IoT application or platform from these multiple sources, a seamless view across the value chain emerges.

Indeed, it seems clear that IoT is beginning to take hold in specific processes – in manufacturing overall, it is estimated that \$267 billion will be invested by 2020.³ But getting a CP-specific view of IoT adoption in manufacturing is more challenging – let alone a view of IoT adoption that looks across CP business processes.

To gain a deeper understanding of IoT adoption trends in the CP industry, SAP recently conducted a global⁴ survey of 176 respondents from the CP industry to better understand current IoT adoption trends.⁵ This report looks at CP industry challenges, areas of highest IoT applicability, and ways that companies are seeking to reap the technology's benefits.

The Internet of Things allows a **seamless view** across the value chain.

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1. The study defines the consumer products industry as the following segments: apparel, food and beverage, footwear, health and beauty aids, accessories, hardlines, domestic goods, and consumer electronics and appliances. For more details on study demographics, please refer to the appendix.
 2. IoT is a superset of technologies that includes machine-to-machine systems, smart grids, wearable devices, and analytics.
 3. Greenough, John, *How the Internet of Things is revolutionizing manufacturing*, BusinessInsider.com, October 12, 2016.
 4. Countries included in the study: Germany, Great Britain, India, Japan, United States.
 5. The research partner in conducting this survey is EKN Research, a division of EnsembleIQ.

THE CHANGING CONSUMER PRODUCTS INDUSTRY LANDSCAPE

The CP industry has historically maintained a consistent focus on customer centricity; however, a series of recent forces have made it increasingly challenging to do so:

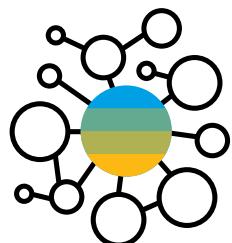
- **Digitally savvy shoppers:** With access to product reviews, price comparisons, and other information, consumers are becoming less brand loyal and ever more focused on value.
- **Changing consumer behaviors:** From online shopping to showrooming and beyond, shopper behavior is impacting CP decisions from category management to sales and operations.
- **High transportation and logistics costs:** Digital consumers demand quick, on-time delivery, forcing CP companies to make heavy transportation investments.
- **Shrinking operating margins:** Increasing costs – whether of raw materials, or transportation, or promotions – are pushing down margins even as CP companies seek to maintain competitive pricing.
- **The entry of new disruptive competitors:** From Dollar Shave Club to Ripple Foods to Casper mattress, new and innovative companies are entering the market at a rapid pace, typically build on innovative, digital business models and unique insights into growing segments of consumers.

THE ROLE OF IOT

With its ability to transform real-time data into business process efficiencies, IoT creates enormous potential for CP companies across multiple business areas – including, for example:

- **Inventory management:** With IoT, CP companies can create a real-time data-based alert system that indicates the need for stock replenishment, provides supply chain transparency, and heightens ability to react to changing consumer demand.
- **Product reordering:** Retailers as well as CP companies can benefit immensely from an IoT-backed end-to-end system that flags and automatically reorders items as needed, alleviating out-of-stocks.
- **Traceability:** Whether it's concern around specific ingredients or the need to pinpoint the exact origin of specific product lots, there is an increasing premium on the high degree of supply chain traceability that IoT can deliver.

IoT creates **enormous potential** for consumer products companies across multiple business areas.



What's driving IoT adoption? Urgent challenges, focused initiatives

TOP CHALLENGES FACED BY CONSUMER PRODUCTS EXECUTIVES

- **35%** assert that frequent fluctuations in raw material costs have created higher operational expenses.
- **32%** cite high logistics/transportation costs as a significant challenge.
- **31%** contend that hyper-competitive retail and distribution environments are driving higher trade promotions and discounts – resulting in shrinking operating margins.

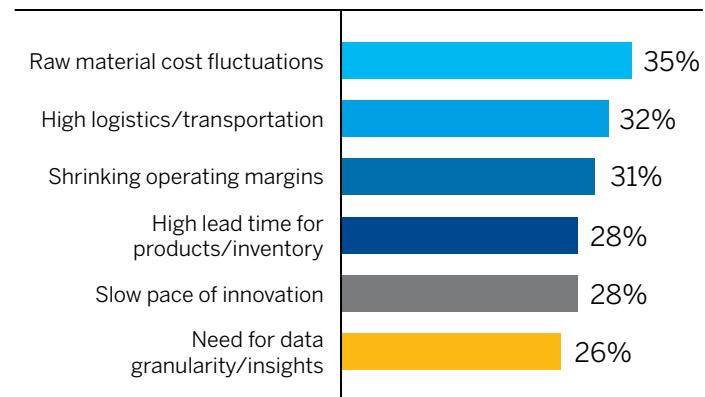
THE STRATEGIC DRIVERS

CP enterprises are focused on strategic initiatives aimed at improving response to demand changes as they arise. They also prioritize efforts designed to improve product lead times and foster innovation.

- For **32%** of CP companies, reacting faster to demand and capacity changes is crucial. Adopting a digital supply chain with IoT-enabled processes has high potential to enable CP companies to respond promptly to market fluctuations.
- **27%** seek to improve lead times. Creating collaborative supply chain platforms linking suppliers, companies, and customers can help shrink lead times through better inventory planning.
- **24%** of CP executives are striving to improve product quality and compliance. Conducting systemic, centralized quality checks of products through use of digital tools can help drive such improvements.

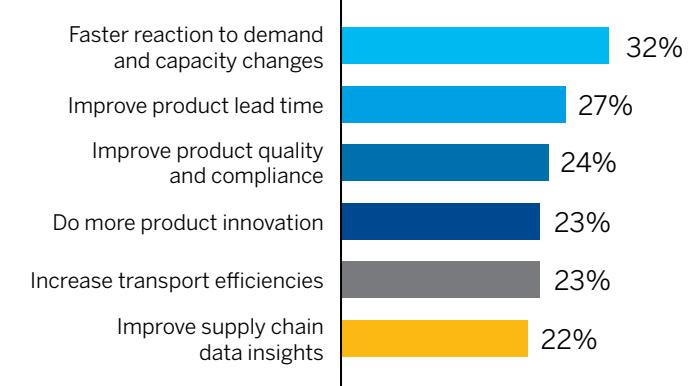
Top Business Challenges and Strategic Drivers
Figure 1

Business Challenges



Q. What are the top 3 business challenges that your organization is facing currently in your supply chain?

Strategic Drivers



Q. Select the top 3 strategic drivers for improving your organization's supply chain.



IoT underpins the highest priority consumer products initiatives

DO CONSUMER PRODUCTS EXECUTIVES UNDERSTAND THE FULL VALUE OF IoT?

The application of IoT is emerging as a priority for many CP companies. Initially, though, IoT applications were limited to discrete operational activities – for example, in factory production units – and connected device data was not leveraged for enterprise use. The advent of high-speed internet and improved data networks now allows companies to leverage data through intelligent applications for end-to-end processes.

- **41%** of CP executives are extremely clear in which areas of their business IoT can be applied. Broadly speaking, IoT has enormous potential to revolutionize how CP companies manage operational processes and consumer interactions, for example:

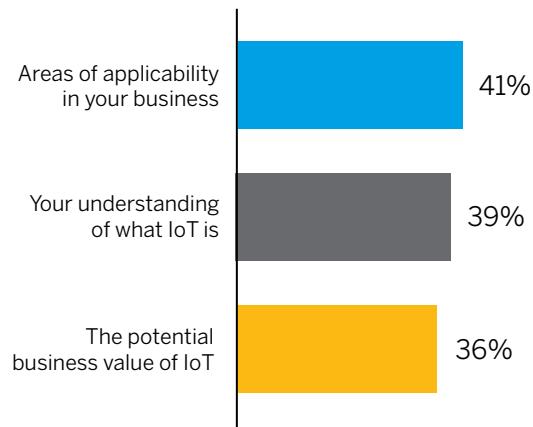
- By harnessing enormous quantities of data, IoT enables CP enterprises to monitor transportation conditions for perishables and minimize losses.
- Sensor-fitted smart shelves enable automated ordering, alleviating stock-outs. Smart shelves also improve brand visibility through correct store placement of products.

- **39%** of CP executives state they possess a clear understanding of IoT and its implications for their business. However, IoT-related use cases are still at an early stage of maturity in the industry.

- Although, as stated, 41% are clear on areas of IoT applicability, only **36%** have a clear understanding of its potential business value. Therefore, it can be difficult to justify investments or garner support for initiatives. Further, the expansive reach of IoT can make it challenging to position within existing frameworks.

Understanding the Full Value of IoT

Figure 2



Q. The Internet of Things (IoT) refers to the business value derived from interconnected and uniquely identifiable embedded computing devices (such as sensors, beacons, RFID, sensors, Wi-Fi access points, machine-to-machine etc.) within the existing Internet infrastructure. Please rate the following on a scale of 1 to 5.

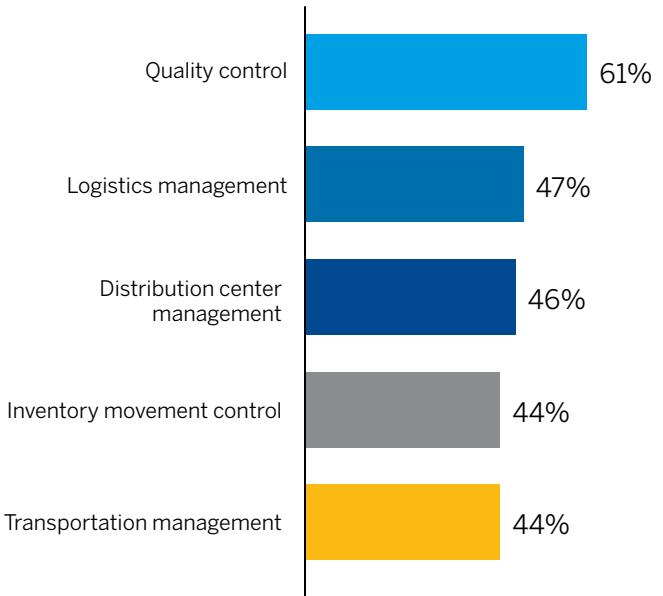
UNLOCKING THE BUSINESS VALUE OF IOT

The potential of IoT is becoming firmly established in the business world; the CP industry is no exception. With the increasing number of connected devices, many CP companies are already making extensive use of collated data within their operations.

- **61%** of CP executives feel IoT has enormous potential to drive improvements in an area where manufacturers have long struggled: quality control,⁶ which requires testing various components and reporting results on a real-time basis.
 - Poor quality can account for as much as 10-15% of operations.⁷ To maintain quality, manufacturers have escalated costs, eating into 15-20% of sales revenue.⁸
- **47%** and **46%** of surveyed companies plan to apply IoT within logistics management and distribution center management, respectively.
- **44%** of CP industry executives believe the value of an IoT application centers on inventory movement control and transportation management.

Planned Areas to Unlock Business Value of IoT

Figure 3



Q: In which of the following areas do you plan to unlock the business value of the Internet of Things (IoT) in your supply chain?
(Select in order of implementation priority on a scale of 1 to 5).

6. Quality control refers to the set of processes related to production, factory, and supply chain-related quality management.
7. Duffy, Grace, *The ASQ Quality Improvement Pocket Guide: Basic History, Concepts, Tools, and Relationships*, Dimensions, 2013.
8. ibid.

Leader-follower analysis: The value proposition of IoT

UNDERSTANDING OF IOT: A LEADER-FOLLOWER⁹ PERSPECTIVE

There are clear distinctions between CP industry leaders and followers in terms of IoT strategic imperatives, adoption, usage, and process implementation.

Strategic Drivers of IoT Leaders

- **32%** of respondents with a very clear understanding of IoT are focused on improving product lead times and minimizing reaction time to demand and capacity changes. In other words, they are focused on reducing demand/supply gaps.
- **31%** prioritize improving product quality and compliance to raise product management standards, revenue and supply chain efficiencies. Maintaining product and packaging quality can reduce losses due to recalls, spoilage, or leakage.

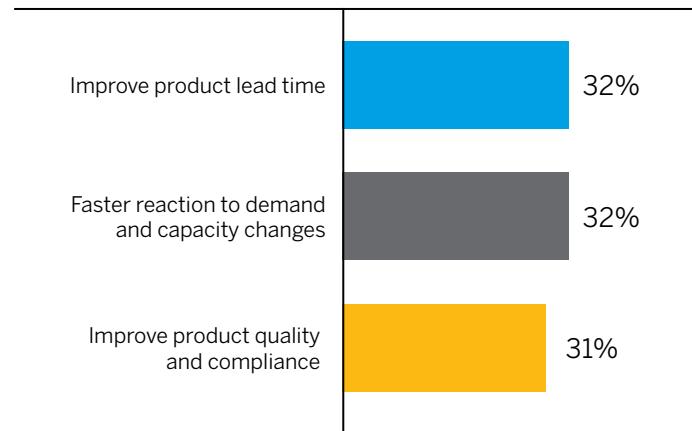
Strategic Drivers of IoT Followers

- For **31%** of respondents who lack a clear understanding of IoT, minimizing out-of-stocks is the top strategic driver for supply chain improvement. By contrast, leader organizations appear to have already implemented initiatives focused on minimizing losses due to delays in production or high lead time.

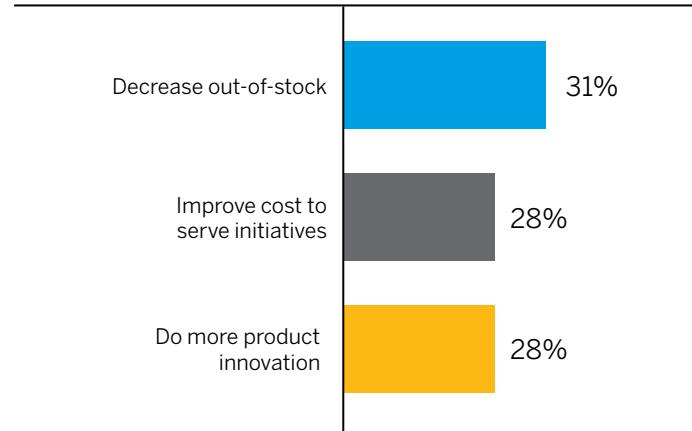
Strategic Drivers: Leader-Follower Analysis (Understanding of IoT)

Figure 4

Leaders



Followers



Q. Please select top 3 strategic drivers for improving your organization's supply chain.

9. Leaders are defined as organizations that have a very clear understanding of IoT; *followers* are defined as organizations lacking a clear understanding of IoT.

IOT APPLICABILITY: A LEADER-FOLLOWER¹⁰ PERSPECTIVE

Strategic Drivers of IoT Leaders

- **32%** of respondents with a clear understanding of IoT applicability have a strategic focus on improving supply chain efficiency through data insights
- **31%** are seeking to improve product lead time
- **30%** aim to improve product quality and compliance

Leaders seek to apply IoT in order to gain meaningful insights from large amounts of in-house data. To cite just one example, reducing store replenishment time would help reduce potential loss of sales due to time lag.

Strategic Drivers of Followers

- **35%** of respondents lacking a clear understanding of IoT applicability are focused on faster reaction to demand and capacity changes as a key strategic driver.
- **27%** seek to decrease out-of-stocks.

In stark contrast with IoT leaders, followers are focused on efforts aiming to reduce demand/supply gaps in stores and inventory shortages.

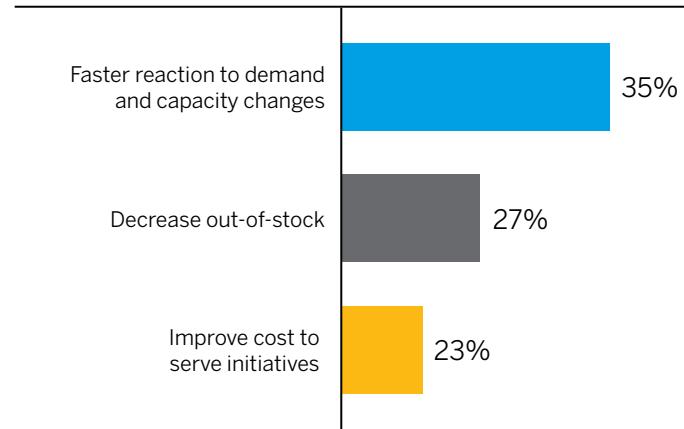
Strategic Drivers: Leader-Follower Analysis (Understanding of IoT Applicability)

Figure 5

Leaders



Followers



Q. Please select top 3 strategic drivers for improving your organization's supply chain.

¹⁰. In this section, *leaders* are defined as organizations with an extremely clear understanding of areas of IoT applicability; *followers* are defined as organizations lacking a clear understanding of areas of IoT applicability.

Key IoT Initiatives of Leaders

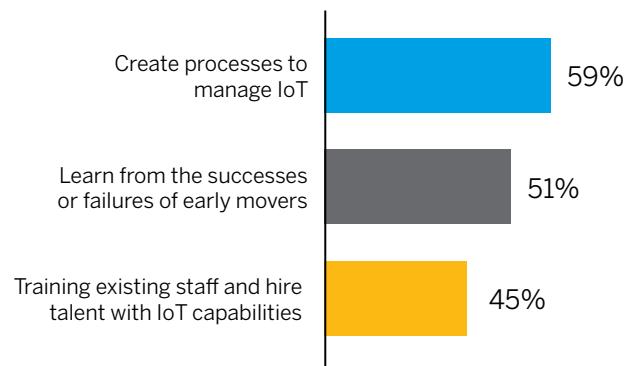
- **59%** of respondents with a clear understanding of IoT's applicability are creating processes to manage IoT in specific business areas.
- **51%** are seeking to absorb and apply learnings from the success or failures of early adopters.
- **45%** are focused on hiring new employees with IoT skills or retraining existing employees to ensure sufficient understanding of IoT.

Key IoT Initiatives of Followers

- By contrast, respondents lacking a clear understanding of IoT's applicability are establishing joint ventures or alliances to exploit IoT opportunities; seeking advice from third-party experts; and conducting or sponsoring research on IoT potential.

Laying the Foundation for IoT (Leaders)

Figure 6



Q: What immediate steps are you taking to execute an Internet of Things (IoT) strategy or an initiative?

Assessing the path forward for IoT in consumer products

THE WAY FORWARD: ARE CONSUMER PRODUCTS COMPANIES READY TO EMBRACE THE CHANGE?

Growth in digital commerce is posing challenges to the CP industry, forcing executives to re-think strategies. Brand value is compromised by empowered consumers. Meanwhile, CP manufacturers struggle with margins depressed by fluctuating raw material costs and high transportation/logistics expenses.

In this context, CP companies have started looking beyond traditional metrics like historical performance, market sentiments, and frequency of new product launches and positioning. Many are turning toward data mining and predictive analytics to increase agility, improve decision making, and drive desired outcomes like improved product quality and faster reaction to demand and capacity changes.

CP companies increasingly recognize that achieving a balance between upholding brand value and meeting increased consumer expectations requires tapping into the power of digital technologies like IoT. Simply put, IoT is changing how the industry operates.

Some companies have invested in IoT technologies like connected sensors.

Others are grappling with achieving a broader strategic vision for how to integrate IoT into their complex organizations. Still more, as our research reveals, are lagging dangerously behind.

Of course, CP companies must rationalize their efforts against those undertaken by customers and partners such as retailers and suppliers. But interest in the massive potential of IoT is quite clearly on the rise in CP, and it promises to be a force for transformation for many years to come.



Achieving a balance between upholding brand value and meeting increased customer expectations requires tapping into the power of digital technologies like IoT. **Simply put, IoT is changing how the industry operates.**

RECOMMENDATIONS AND WAY FORWARD

For CP companies who are beginning to embark on IoT initiatives, we offer the following general recommendations. Of course, specific actions must be tailored to an individual company's priorities, plans, and capabilities.

Short-Term (<6 months):

- Develop an enterprise-level sensory and web-connected device data platform strategy, including the following 3 key components: IoT data management, IoT data security and actionable insights management.
- Start with a business problem-led IoT use case approach and pilot incubation methodology. Select IoT use cases that can enable tangible outcomes in key process areas.

Mid-Term (Up to 2 years):

- Create an internal IoT data modeling team that can integrate, analyze, and interpret IoT device, sensor and messaging data on a continuous real-time basis.
- Integrate both structured and unstructured IoT data sources within the enterprise and distributed network environment.

- Apply an IoT roadmap approach for improving varied use cases across operational and customer-centric business functions. Such roadmaps can help CP companies in introducing new IoT platform-related improvements and, ultimately, realizing higher business value.

Long-Term (Up to 3 years):

- Develop a robust yet flexible roadmap for agile use case development, user-led innovation, and partner ecosystem approach for longer term IoT platform maturity and stability.



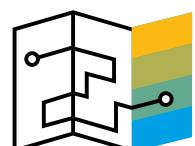
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An IoT roadmap approach can help consumer products companies realize **higher business value**.



Study Demographics



Demographics

Figure 7: The objective of the survey is to understand the sensory technology trends in consumer goods supply chain for evaluating the state of the CPG industry

176

Total No. of Respondents

Industry: Consumer Packaged Goods

Business Segment

• Other consumer goods	23%
• Consumer electronics and appliances	18%
• Food & beverage (including alcohol)	15%
• Health & beauty aids / OTC pharma / personal care / baby care	12%
• Footwear / apparel / accessories	11%
• Hardlines (including furniture, sports equipment and toys)	11%
• Domestic goods	10%

Target Respondent

• Manager	37%
• Director	30%
• CXO	23%
• Vice President	6%
• SVP or EVP	4%

Geography

• United States (U.S.)	43
• United Kingdom (U.K.)	30
• Japan	30
• India	43
• Germany	30

Responding Company Revenue Allocation by Country

Figure 8

U.S.

• Less than \$500 million	42%
• \$500 million to \$1 billion	14%
• \$1 billion to \$5 billion	19%
• \$5 billion to \$10 billion	9%
• More than \$10 billion	16%

U.K.

• Less than £100 million	17%
• £100 million to £500 million	20%
• £500 million to £1 billion	27%
• £1 billion to £5 billion	27%
• More than £5 billion	10%

Germany

• Less than €100 million	23%
• €100 million to €500 million	20%
• €500 million to €1 billion	23%
• €1 billion to €5 billion	27%
• More than €5 billion	7%

Japan

• Less than ¥100 million	17%
• ¥100 million to ¥500 million	17%
• ¥500 million to ¥1 billion	20%
• ¥1 billion to ¥5 billion	23%
• More than ¥5 billion	23%

India

• Less than Rs.500 million	23%
• Rs.500 million to Rs.990 million	32%
• Rs.1 billion to Rs.9.9 billion	19%
• More than Rs.10 billion	26%

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