

# Report: Innovation Diffusion Analysis – Laifen Wave Toothbrush

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**Course:** Marketing Analytics

## Introduction

Innovation diffusion analysis helps us understand how new products are adopted over time. This report focuses on the **Laifen Wave Toothbrush (2024)**, a groundbreaking electric toothbrush that combines oscillation and vibration technologies, alongside app-based customization and eco-friendly design. Using historical data from a comparable innovation, the **Philips Sonicare DiamondClean (2010)**, we estimate adoption trends using the **Bass Diffusion Model**.

The goal is to forecast the diffusion path of the Laifen Wave globally and estimate the number of adopters per year.

## 1. Product Overview – Laifen Wave Toothbrush

The Laifen Wave Toothbrush is a premium oral care device featuring:

- **Dual-motion cleaning:** oscillation up to 60° and vibration up to 66,000 strokes per minute
- **App-based customization:** control over speed, oscillation, and vibration
- **Hygienic nano-molded design:** prevents bacterial buildup
- **Dynamic brush balancing:** metal counterweight reduces vibration and protects gums
- **Eco-friendly packaging:** biodegradable materials and no power adapter included
- **Magnetic charging and waterproofing:** IPX7-certified, low power consumption modes

**Price:** \$79.99

**Current Users:** ~8 million

**Warranty:** 1 year, 30-day money-back guarantee

The product represents a major step forward in smart oral care, combining technological precision, personalized user experience, and sustainability.

## 2. Similar Innovation – Philips Sonicare DiamondClean (2010)

The **Philips Sonicare DiamondClean** introduced sonic vibration technology (up to 31,000 strokes per minute) to the mass market. At the time, it represented a shift from traditional oscillating brushes toward high-frequency vibration and digital feedback.

**Comparison:**

Feature	DiamondClean (2010)	Laifen Wave (2024)
Cleaning mechanism	Vibration only	Vibration + Oscillation
User control	Basic modes	App-based, real-time customization
Design	Standard	Nano-molded, hygienic, eco-friendly
Market impact	Premium oral care	Global, tech-forward, health-conscious

The Laifen Wave extends the innovation trajectory of DiamondClean by integrating dual motion, smart controls, and sustainable design features.

### 3. Historical Data

Historical global electric toothbrush adoption data (2010–2030) was used as a proxy for Laifen Wave adoption:

Year	Revenue (USD billion)	Estimated Units (million)	Cumulative Units (million)
2010	1.751	35.02	35.02
2011	1.821	36.42	71.44
2012	1.894	37.88	109.32
...	...	...	...
2030	5.042	100.84	1293.50

Source:  Electric Toothbrush Market Size, Share & Top Key Players, 2030

### 4. Bass Diffusion Model

The **Bass Diffusion Model** predicts new product adoption using three parameters:

- **p (coefficient of innovation)**: likelihood of adoption by innovators
- **q (coefficient of imitation)**: influence of previous adopters on new adoption
- **M (market potential)**: total possible number of adopters

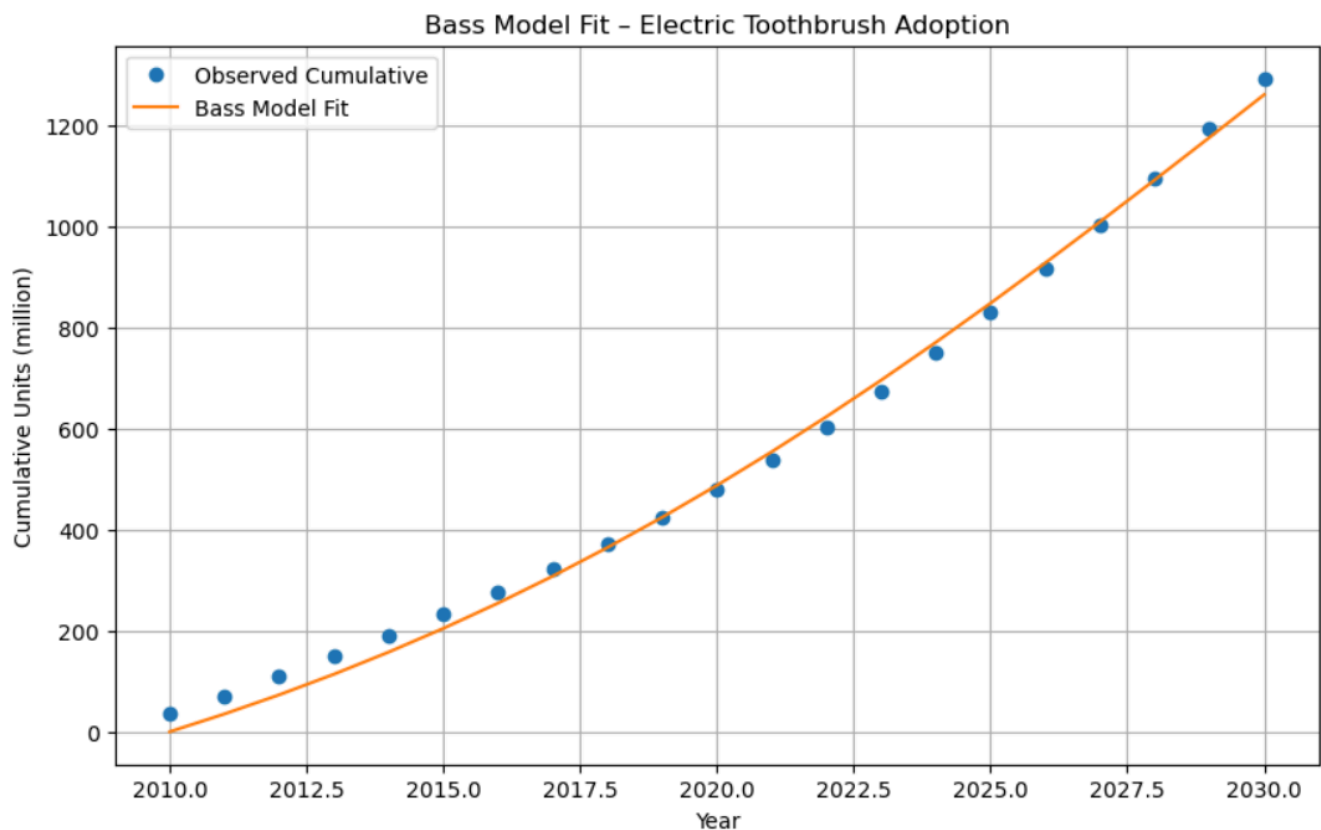
Using nonlinear regression (curve\_fit) on cumulative adoption data:

- **p = 0.0113** → a small fraction of **innovators** adopt early

- **q = 0.0894** → imitation plays a moderate role in spreading adoption
- **M = 3,000 million units** → global market potential

This suggests:

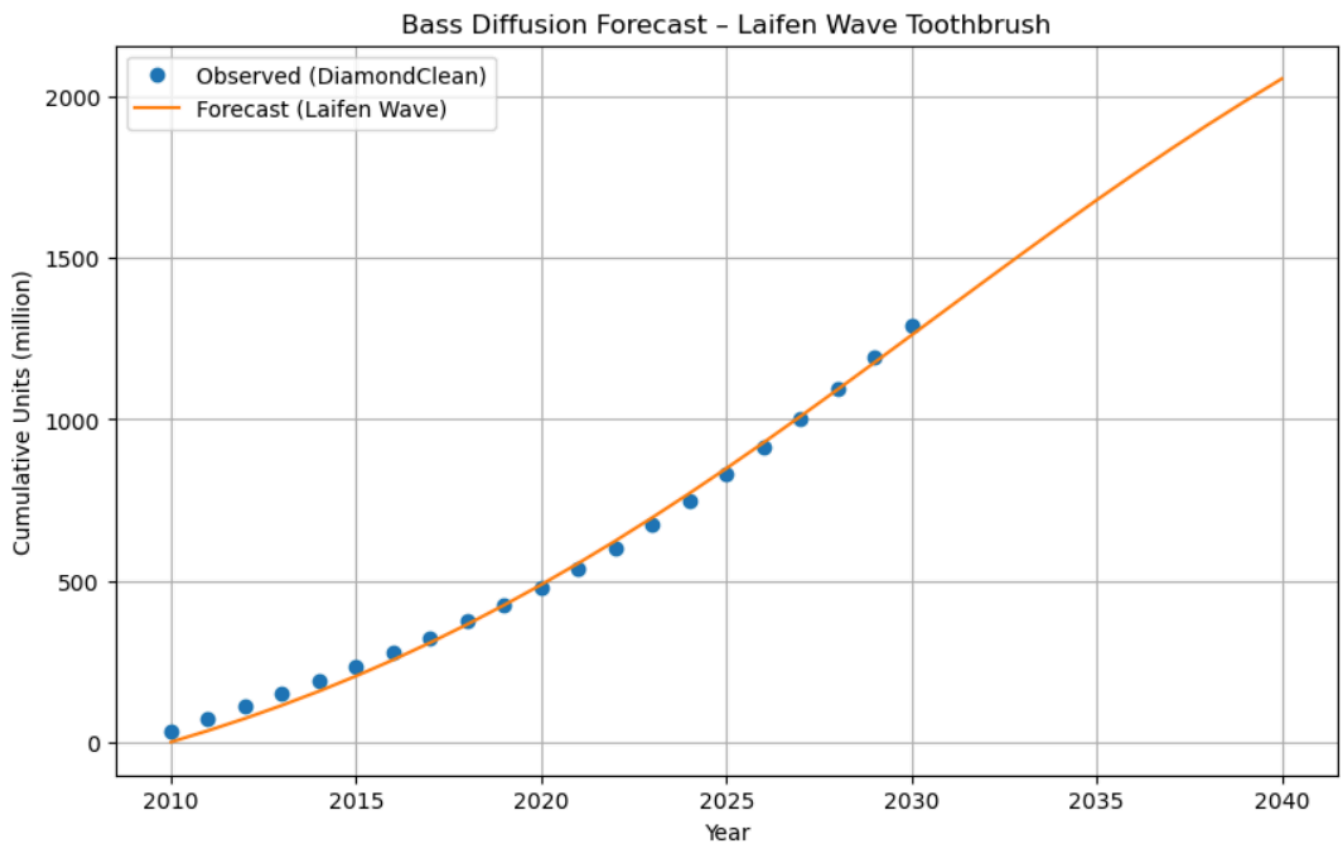
1. **Early stage:** Adoption will start slowly, as innovators try the Laifen Wave.
2. **Growth stage:** Imitators gradually drive adoption; the S-curve will start to rise more noticeably.
3. **Saturation:** The market could eventually approach 3 billion users, reflecting a **global potential** if the product reaches wide distribution.



## 5. Diffusion Forecast – Laifen Wave Toothbrush

Using the Bass model, we forecast global adoption of the Laifen Wave:

- **Annual new adopters:** peak occurs around mid-lifecycle (~2030–2035)
- **Cumulative adopters:** projected to approach market potential of ~1.3 billion globally



## 6. Scope

**Scope:** Global electric toothbrush market

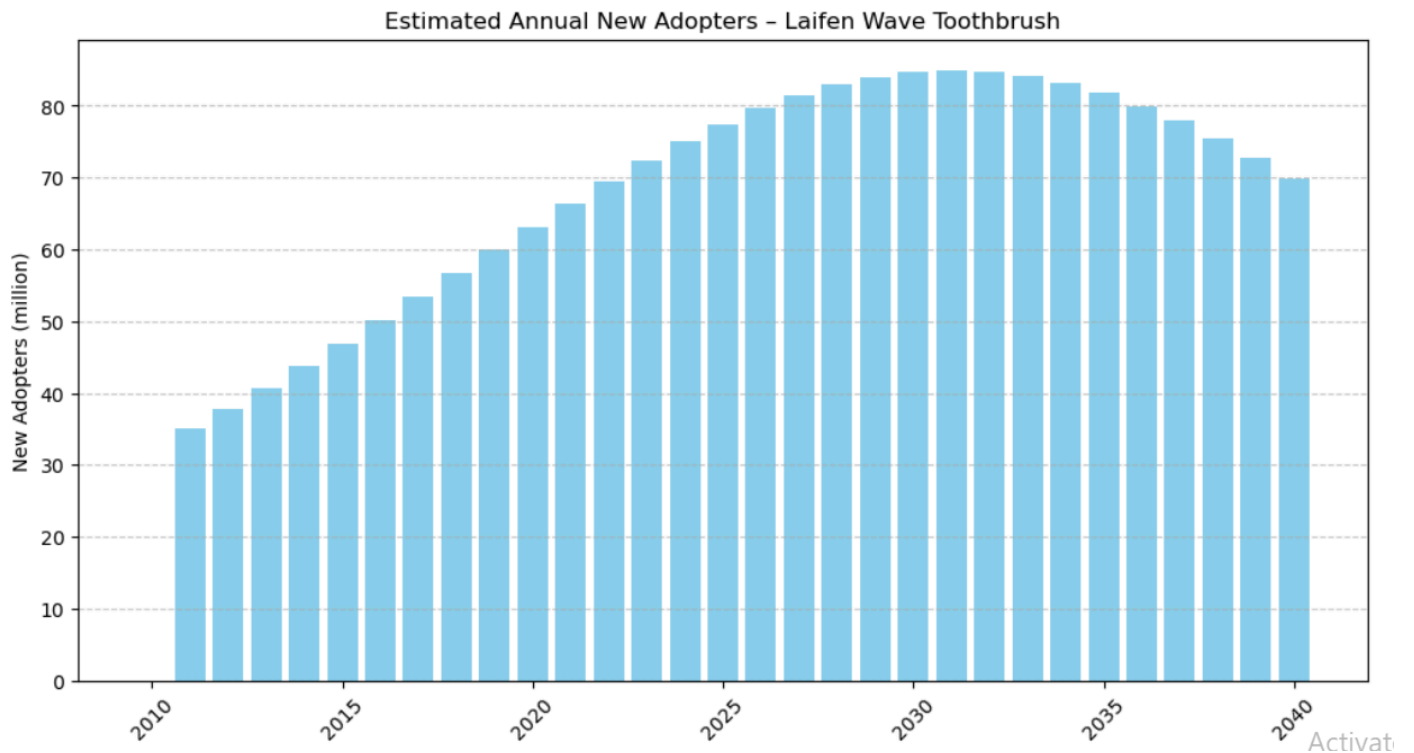
**Justification:**

- Laifen Wave is sold internationally, competing with Philips, Oral-B, and other brands.
- Historical data used is global, providing realistic forecasts for worldwide adoption.
- Bass parameters estimated on global data capture both innovation and imitation dynamics.

## 7. Estimated Number of Adopters

Year	New Adopters (million)	Cumulative Adopters (million)
2024	77.44	749.96
2025	80.92	830.88
2026	84.56	915.44
2027	88.38	1003.82
...	...	...
2030	100.84	1293.50

Adoption follows the classic S-curve of Bass diffusion, with early adoption driven by innovators and peak adoption driven by imitators.



## Conclusion

- The **Laifen Wave Toothbrush** represents the next stage in smart oral care innovation, combining dual motion cleaning, app customization, and sustainable design.
- Using historical data from **Philips Sonicare DiamondClean**, we estimated Bass model parameters
- Forecasts suggest that global adoption will follow an S-shaped curve, peaking in the late 2020s and approaching market saturation around 2030.
- Visualization of annual new adopters and cumulative adopters provides actionable insight into market growth and adoption dynamics.