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# Distributed R&D Case Study: InnoCentive

Managing Innovation: Emerging Trends  
Massachusetts Institute of Technology

Darren J. Carroll  
President & CEO  
March 3, 2005

# The Problem(s)

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- For Innovation-Driven Companies
  - Increased pressure for faster, more cost-effective R&D
  - Monolithic financial risk
  - Limited access to share of mind
  
- For Scientists and Engineers
  - Retirement does not equal end of productivity
  - Geography trumps talent
  - Excess capacity has no channel for distribution

# Opportunity: A Perfect Storm for Sci/Tech Companies



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## Reduced inflow of foreign scientific talent

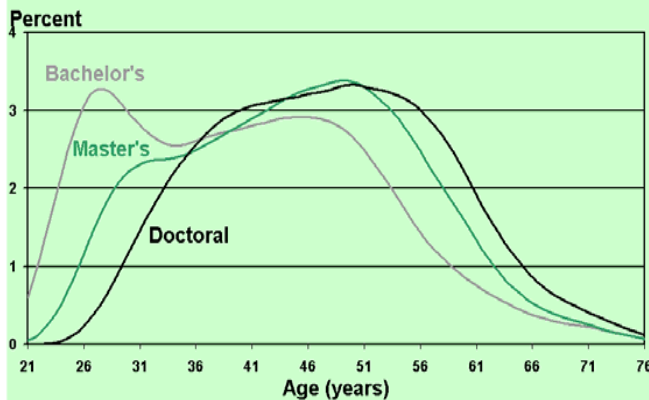
Table O-1  
Visa applications and refusals by major high-skilled categories: FY 2001–2003

Visa action	2001	2002	2003
<b>Applications</b>			
Thousands			
Student (F-1)	400.0	346.4	325.8
Exchange visitor (J-1)	279.5	278.6	295.6
Other high-skill related	248.4	203.6	200.2
<b>Refusals</b>			
Percent			
Student (F-1)	27.6	33.3	35.2
Exchange visitor (J-1)	7.8	10.5	15.9
Other high-skill related	9.6	11.9	17.8

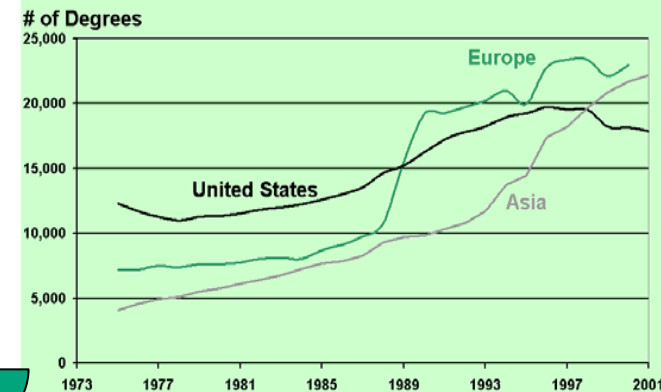
**Aging U.S. scientific workforce**

**ROW has surpassed U.S. in science education**

Age Distribution of Individuals with S&E Degrees in U.S. Workforce: 1999



NS&E doctoral degrees in United States, Europe, and Asia: 1975-2001



# Our Key Resource: Untapped Talent Pools

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## Traditional pools

- US, EU Academics
- Contract labs (FTE)
- Individual networks

## Opportunity pools

- Global Academia
- Researchers in Russia, India, China, etc.
- Scientists in other industries
- Excess capacity
- Retirees

# Our Platform: How InnoCentive Works Today



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## InnoCentive Operations

The screenshot shows the InnoCentive website homepage. At the top, there is a navigation bar with links: About Us, InnoCentive Challenges, Using the Website, My InnoCentive, Seeker Companies, and News & Press. Below this, the main content area is divided into several sections:

- welcome**: A introductory text about the platform's mission to match scientists with R&D challenges.
- SEEKERS**: A section for companies looking for solutions, with a link to "Learn More".
- SOLVERS**: A section for scientists offering solutions, with a link to "Learn More".
- AWARDED CHALLENGES**: A table listing past winners and their challenges.
 

AWARDED	CHALLENGE
Winner: Adipic Acid Awarded on: Oct 21, 2003 Beat Bio	<b>SOLVED</b> INNOCENTIVE 26933 Phosphoric acid (Derivative 1)
- FEATURED InnoCentive Challenges**: A list of current challenges with details like "INNOCENTIVE 222328" and "ANALYSIS".
- My InnoCentive**: A user login section with fields for "Name" and "Password", and a "Log In" button.

At the bottom of the page, there are links for "Home", "Contact", "About Us", "Privacy", and "Terms of Use".

Seeker Companies

Solvers

# Center of the Scientific Conversation



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# Scientific Disciplines of Challenges

CHEMISTRY  
& APPLIED  
SCIENCES



- Analytical Chemistry
- Catalysis
- Colloid Chemistry
- Formulation Chemistry
- Materials Science
- Nanotechnology
- **Organic Chemistry**
- Physical Chemistry
- Polymer Chemistry
- Synthetic Chemistry

LIFE SCIENCES



- Biochemistry
- Biomarkers
- Enzymology
- Food Science
- Pharmacology
- Physiology
- Plant Biology

## Challenge Types

### Theoretical

- “Paper” Chemistry
- No lab work required

### Reduction to Practice

- “Wet Chemistry”
- Requires lab work



## Solver Success Case Study

- Peroxisome-Proliferator-Activated Receptors (PPARs)
- *Reduction to practice challenge*

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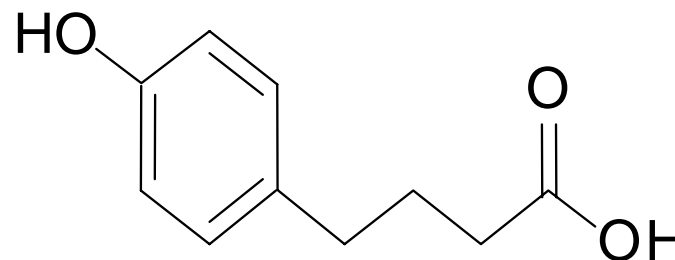
## INNOCENTIVE 3109

R4-(4-HYDROXYPHENYL) BUTANOIC ACID

POSTED: June 26, 2001

DEADLINE: Nov 30, 2001

\$25,000USD



- **Abstract**

An efficient synthetic strategy for the following butanoic acid derivative is required. This molecule has been previously reported in the chemical literature but the existing known synthetic route may be lengthy, expensive and/or low yielding. Devise and execute the "best synthetic pathway".

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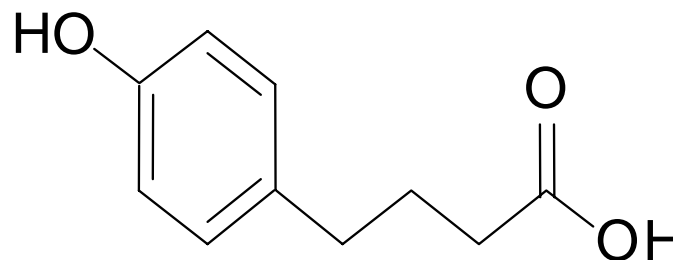
## INNOCENTIVE 3109

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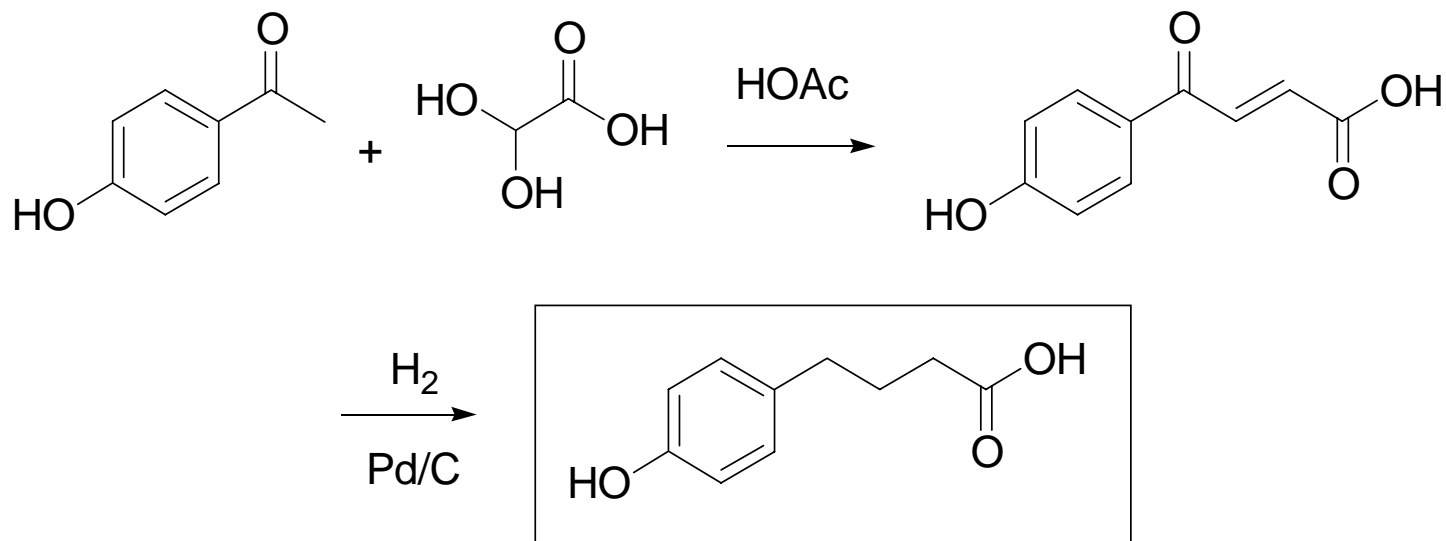


### ○ Solution Criteria

- 2 steps or fewer
- >80% overall yield
- >95% purity
- <\$100/Kg
- 2.0g white to off-white solid



# Chemistry: Complex Synthesis



- **Solution Meets Challenge Criteria:**

- 📄 2 steps or fewer

- 📄 >80% overall yield

- 📄 >95% purity

- 📄 Delivery of 2.0g white to off-white solid

- **Solver receives \$25,000 USD!**

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# Our Model Works

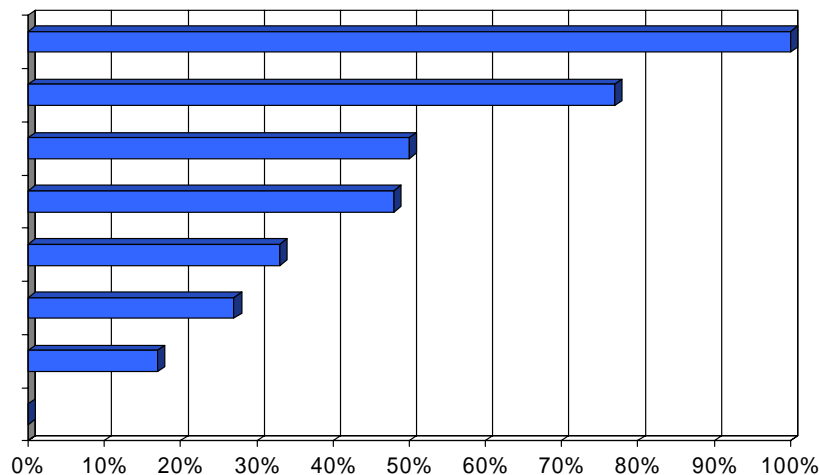
## ...some of the Talent Accessed

- ***INNOCENTIVE 216128 (Protein crosslinks)***  
Head of Indian research institute
- ***INNOCENTIVE 3109 (R4-(4-Hydroxyphenyl) Butanoic Acid)***  
Retired head of Hoechst R&D
- ***INNOCENTIVE 96229 (Regio-Stereocontrolled Tricyclic Alcohols)***  
N. Ireland CRO and US Professor
- ***INNOCENTIVE 258382 (Paracrystalline Arrays)***  
Outside discipline
- ***INNOCENTIVE 55195 (Substituted isoquinoline)***  
Russian scientist



## Why Do Solution Rates Vary?

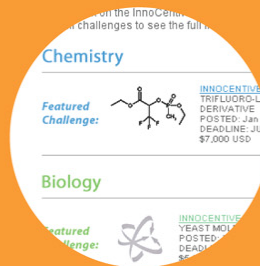
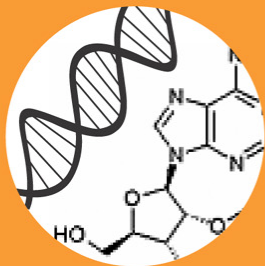
- Varies Among Different Seeker Clients



- Synthetic Organic Synthesis Challenges: 50%
- Success rate related to award level and nature of scientific problem
- Experimentation provides evolution


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# Comprehensive IP Protection



## 1. Challenge formulation

- Trusted companies
- Established IPR positions
- Anonymity
- Appropriate information
- Confidentiality

## 2. Information access

- Gated details
- Confidentiality/IPR agreements
- Secure, private project rooms

## 3. Submission and award

- Solver verification
- InnoCentive administers presentation and payment
- Awardees transfer IPR; all others retain IPR

**InnoCentive facilitates entire process**



# Creating Value for All Participants **INNOCENTIVE**

## Seekers

- Project Roadblock
- Capacity – cost reduction
- Innovation
- Claim Staking
- Revive Stalled Projects
- Close “Dead” Projects
- Culture – work outside the walls

## Solvers

- Intellectual challenge
- Business development opportunities
- Financial reward
- Recognition



# World's Largest Virtual Lab



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InnoCentive currently has 75,000+ Solvers  
in 175 countries and 44 scientific disciplines



# If You Build It..... So What

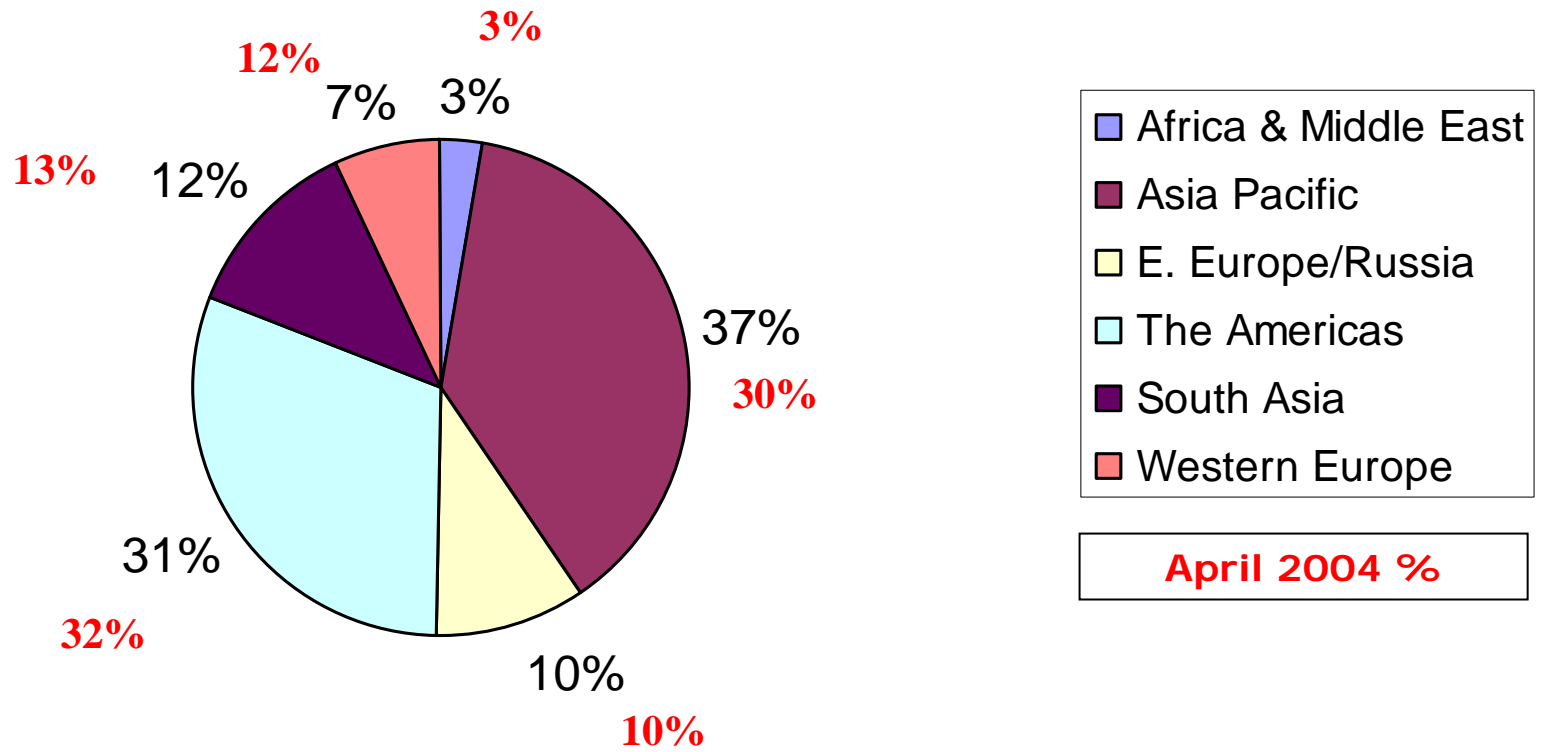
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- Direct e-mail marketing of Challenges to targeted Solvers
- Major Global Program Elements
  - Online/Offline Advertising
  - Public Relations
  - Direct Marketing
  - Market Research
  - Thought Leader Development
  - Trade Shows/Conferences
  - Referral Program
- Focus Geographies
  - China, India, Russia/Eastern Europe

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# Solver Base Increasingly Asian

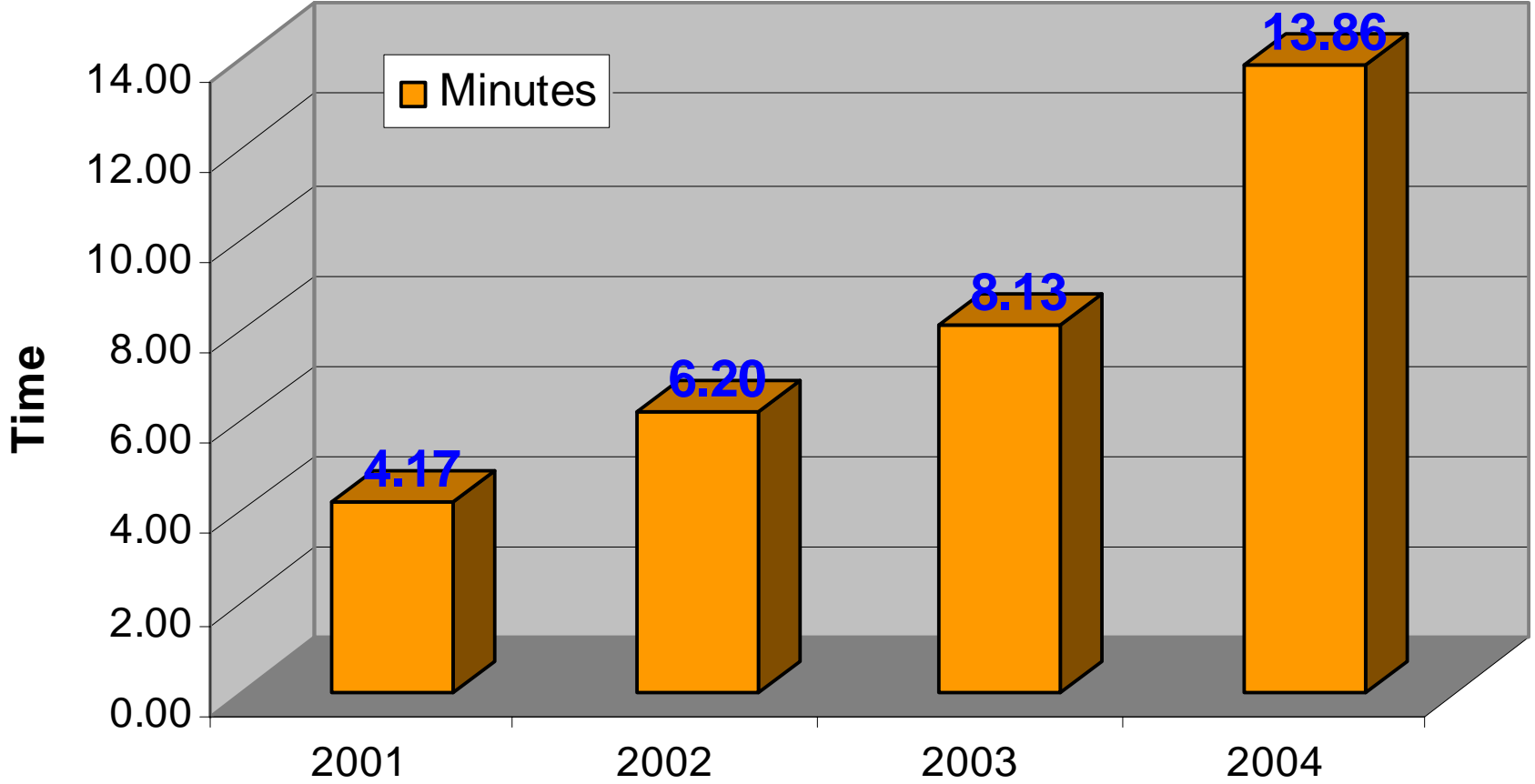
## Solver Demographic December 2004



# Steady Rise in Time Spent on Website



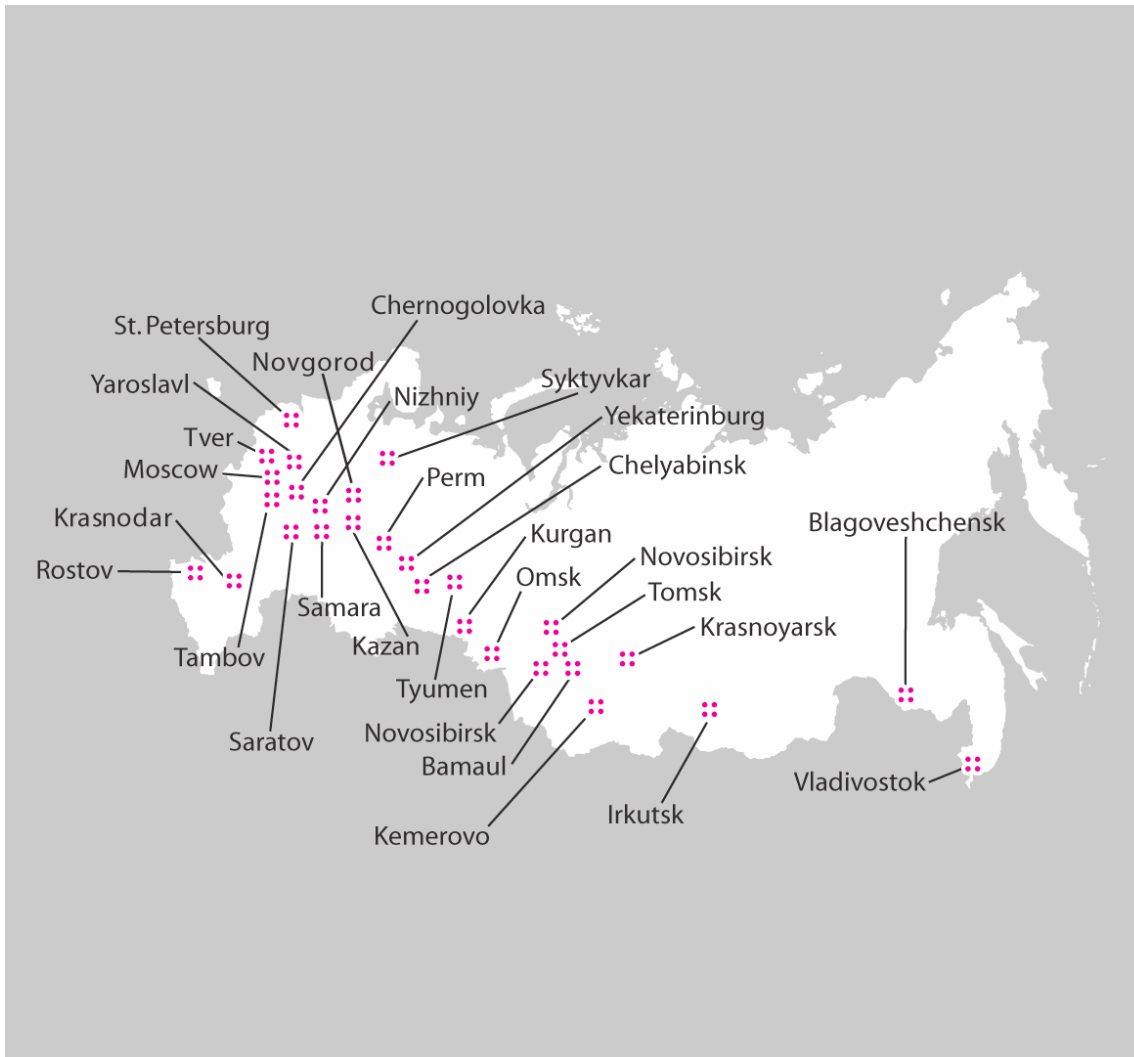
## Average Length of Visit to Website





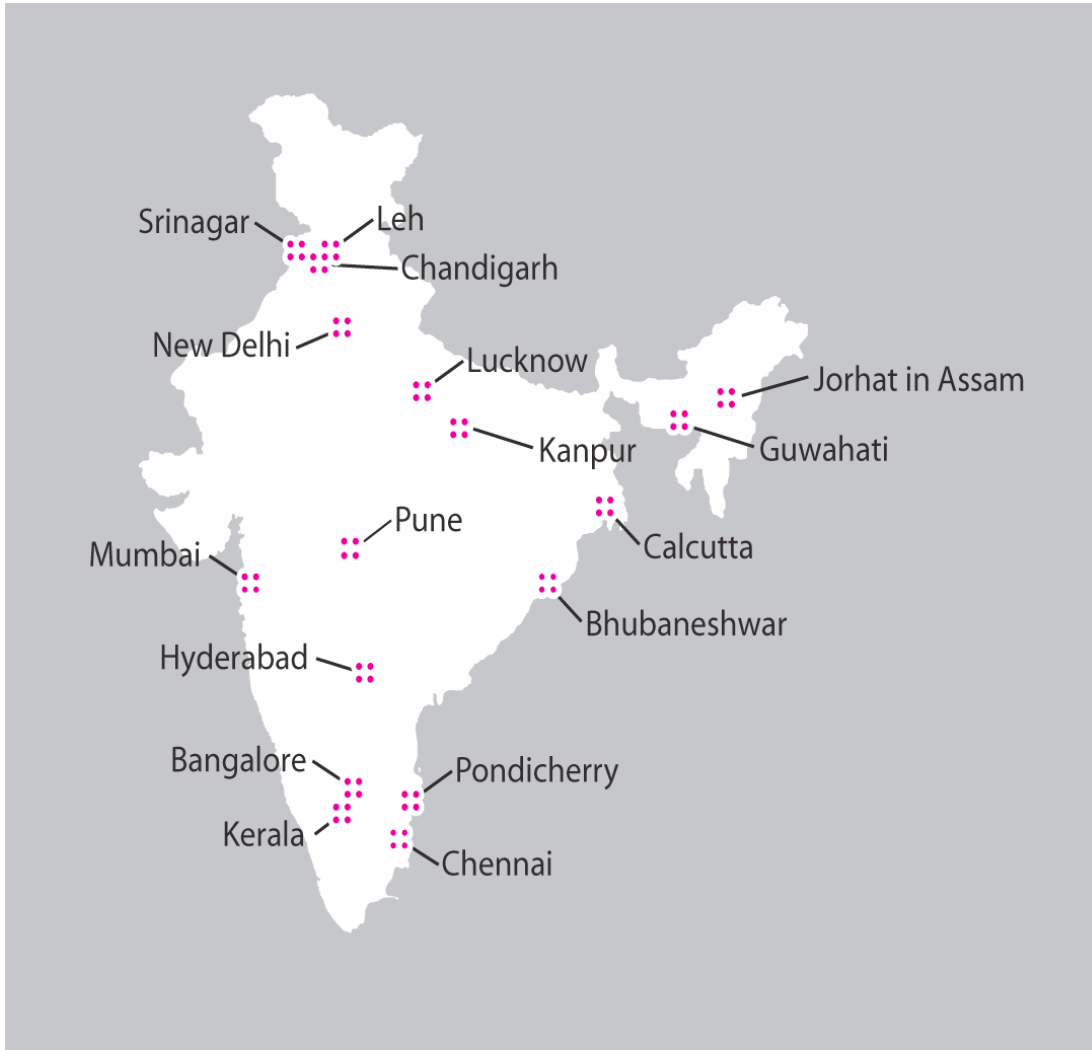
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# Target Market: Russia



- Scientific Conferences
- Public Relations
- Advertising
- Partnerships
  - Russian Academy of Sciences
  - Universities
- Direct Marketing

# Target Market: India



- Advisory Board
- Scientific Conferences
- Public Relations
- Partnerships
  - IITs
  - CSIR, NCL, IICT
  - IChE
- Direct Marketing

# Target Market: China



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- Partnerships
  - Chinese Academy of Sciences
  - Universities
  - National Science Foundation
- Country Manager
- Major Scientific Conferences
- University Programs
- Direct Marketing