![aaum research & analytics logo]

## Corporate Presentation
## &
## Case Studies

### Dec, 2013

**AAUM Confidential**

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# Corporate profile

Founded by **IIT Madras alumnus** having extensive global business experience with **Fortune 100 companies** in **United States** and **India** having three lines of business

| Analytics | Competitive Intelligence | Livelihood |
|---|---|---|
| • Appropriate statistical models through which clients can measure and grow their business. | • Actionable insights to clients for their business excellence | •Services ranging from promotion of livelihoods, implementation services, livelihood & feasibility studies. |

✓ Key Focus Areas in **Advanced analytics and Predictive analytics**

✓ Product – **geniSIGHTS (Analytics/BI), Ordo-ab-Chao (Social Media)**

✓ More than **25 consulting assignments** for Businesses & Govt orgs

✓ Partnership – **Actuate, IIT Madras, TIE and 3 strategic partnerships**



Aaum's office, IIT Madras Research Park

✓ Dedicated corporate office at **IIT Madras Research park since 2009**

## Advisory board

### Prof Prakash Sai

Dr. Prakash Sai is professor at the Department of Management Studies, Indian Institute of Technology Madras. He has wealth of international consulting experience in Strategy Formulation

### Puneet Gupta

Puneet spearheads the IFMR Mezzanine Finance (Mezz Co.), is strengthening the delivery of financial services to rural households and urban poor by making investments in local financial institutions.

### Padma Shri Dr. Ashok Jhunjhunwala

Dr. Ashok Jhunjhunwala is Professor at the Department of Electrical Engineering, Indian Institute of Technology Madras India. He holds a B.Tech degree from IIT, Kanpur, and M.S. and Ph.D degrees from the University of Maine, USA.

# Competencies in

## Advanced analytics
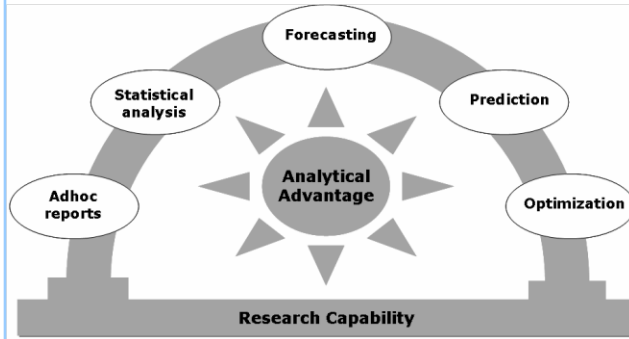


Build appropriate statistical models through which clients can measure and grow their business.

### Expertise in

- Digital Media
- Finance/Insurance
- Travel & Logistics
- Retail
- Lifestyle
- Human Capital
- Government organizations
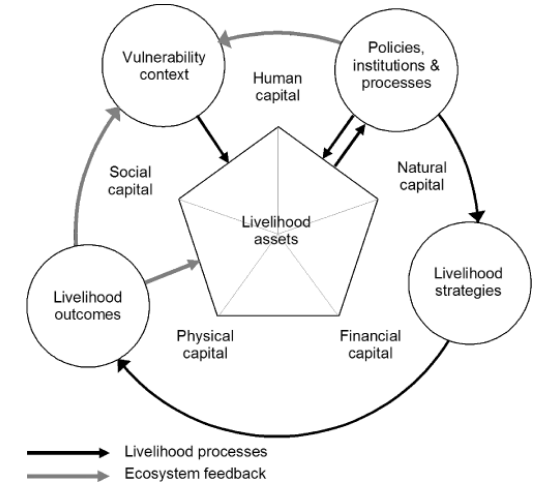- Research & training

## Competitive intelligence



Provide actionable insights to clients for their business excellence.

### Expertise in

- Business Entry
- Business Expansion
- Market research

## Livelihood



Perform livelihood services ranging from promotion of livelihoods, implementation services, livelihood and feasibility studies.

### Expertise in

- Government organizations
- Non Government organizations
- Corporate with livelihood focus
- Research

# Our past analytical assignments<Livelihood and Competitive intelligence initiatives not discussed here>

**Digital Media**
- Mining sentiments from social media – Movie analysis for a major Television network
- Campaign and Publisher scoring for a major US based digital media & content platform firm

**Finance**
- BI & analytical capability for major fin institution.
- Credit scoring to grade & monitor the performance of SHGs – A product in making
- Geographic Dispersion of Business Risks for a financial research institute

**Insurance**
- Predicting Ins claims & forecasting revenues in healthcare industry for a US based vendor
- Household wealth at Risk deployment for a major financial institute

**Travel/ Logistics**
- Fare analysis, assigning credit limits, Customer scoring, trend analysis, etc for largest integrated travel & travel related firm
- Agents analytics, customer engagement, churn analysis, customer acquisition, dynamic pricing, route optimization for major Ticket booking company
- Lodging analytics for leading global lodging solutions company

**Retail**
- Market Basket Analysis & Loyalty Management – Pilot case proposed to a major retail player
- Catchment prediction - quantitative model that helps retailers to identify the vantage site.

**Lifestyle**
- Analytics support for a major Television network
- Recommendation Engine for Matrimonial company

**Human Capital**
- Strategic partnership with a major Employee Life-cycle Management firm to provide actionable insights to their clients

**Big data**
- Hadoop – HDFS, Mapreduce, Hive, Pig, Hbase, Cloudera
- Efficient ways to handle big data using state-of-art memory mapping techniques and parallelization techniques

**Cloud**
- BI dashboard/analytics environment specific to clients on an EC2 instance hosted at AWS.
- Provision to switch on/off the instance at the click of a button to save the running costs.

**Reports**
- Reports in the form of intelligent dashboards
- Business reports in the format you like - doc, ppt, excel, html, pdf, etc
- Partnership with Actuate for world class reports

**Product**
- geniSIGHTS - Advanced analytics/BI product that is Customizable, extensible in cloud and big data environment,
- Ordo-ab-Chao - State-of-the-art social media analytical tool to predict the Business sentiments

**Government Organization**
- Periodic assessment of National Rural Employment Guarantee Act (NREGA) in partnership with IITM's RTBI, as part of Ministry's network | Poverty indicators
- Election Analytics

**Research**
- Domain specific geniSIGHTS – version 2
  - Retail | Travel | Finance | Digital Media
- Big data analytics and emerging technologies

**Training**
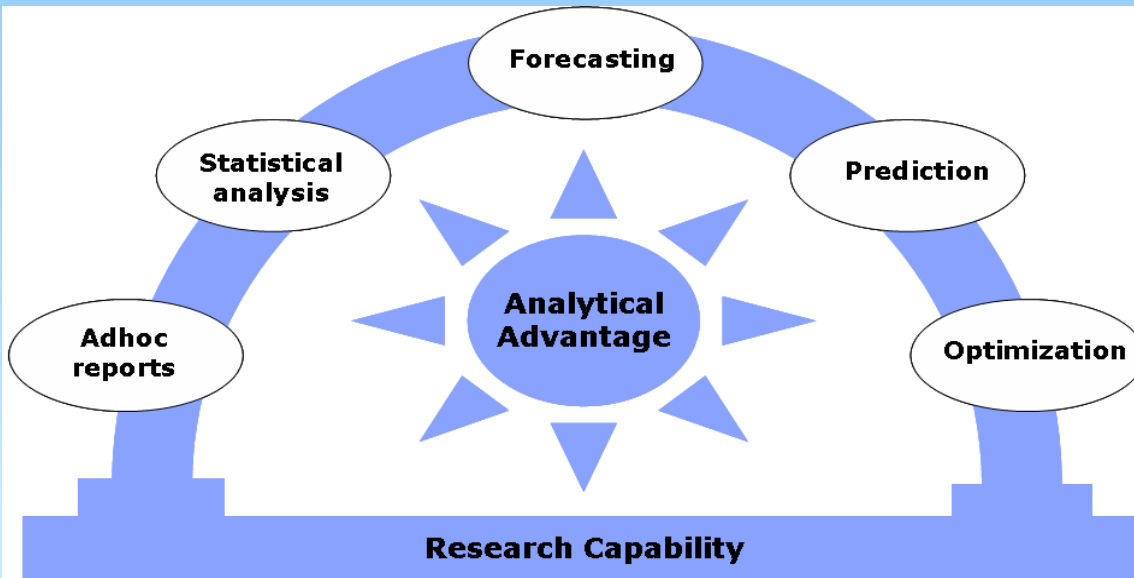- Analytics for Business sucess & excellence
- Big data workshops/trainings

## Analytical Advantage Using Mathematical modeling

Forecasting

Statistical analysis

Prediction

Adhoc reports

Analytical Advantage

Optimization

Research Capability

## Past Case studies

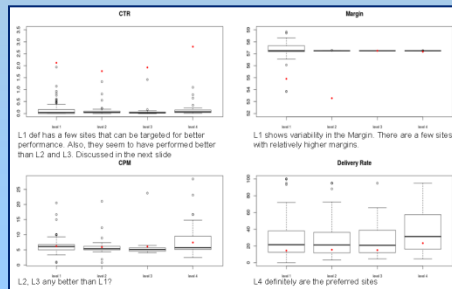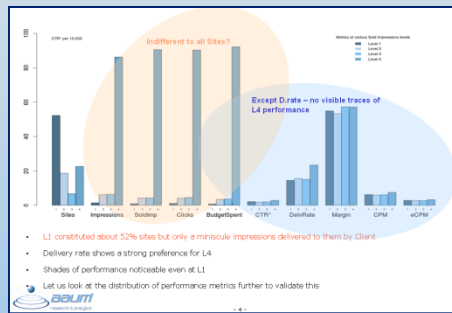# Case Study : Campaign and Publisher scoring for a major US based digital media & content platform firm

**Project Context:** Our client, a US based media and content platform firm for engaging the audience with the most money and influence online with more than 1,000 publishers as partners. The client approached Aaum to reap analytical insights from their humongous transaction data

**AAUM's Contribution:**
- Devised and tracked the Key proportions and Key Performance across the sites and publishers
- Achieved "performance scores" to qualify the site/campaign performance characteristics (CTR, Margin, CPM and Delivery rate) and got validated.
- Extended the scoring technique to derive segment specific indices and compared the peer campaigns
- Root cause analysis: Inspection of site performance attributes of the critical campaigns

**Sample Deliverables**

… Key proportions and Key Performance

… qualifying the performance by scoring

… scoring is extended further to derive segment specific indices and compared with their peers
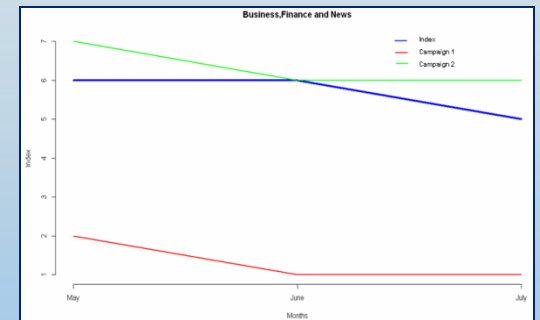


Root cause analysis of the critical campaigns

… acid test on our scores

| Sites | Monthly | | | | Fortnightly | | | | Weekly | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S1 | %ile | S2 | %ile | S1 | %ile | S2 | %ile | S1 | %ile | S2 | %ile |
| Site 1 | 5 | 88.53% | 7 | 95.06% | 5 | 89.72% | 7 | 91.20% | 5 | 94.13% | 7 | 88.67% |
| Site 2 | 7 | 100.00% | 7 | 88.58% | 7 | 93.15% | 6 | 99.73% | 5 | 99.73% | 7 | 96.48% |
| Site 3 | 5 | 98.40% | 7 | 88.27% | 5 | 93.83% | 7 | 91.20% | 5 | 94.13% | 7 | 94.14% |
| Site 4 | 1 | 34.40% | 1 | 35.80% | 1 | 34.59% | 1 | 31.73% | 1 | 31.20% | 1 | 33.20% |
| Site 5 | 1 | 34.40% | 1 | 39.50% | 2 | 43.49% | 2 | 33.06% | 2 | 34.40% | 2 | 37.50% |

Objective accomplished!
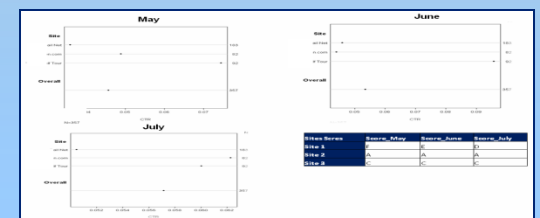
# Case Study : Recommendation engine for a major Matrimonial company

**Project Context:** Our client, a major Matrimonial firm in India approached us to develop a robust recommendation engine based on the customer profile, behavioral characteristics.

**AAUM's Contribution:**
- Developed a recommendation engine that finds on the relevant profiles by similarity scores. Similarity scores are built by advanced analytics of the past customer likes, choices, etc.
- The recommendations could further be enhanced by customer preferences.

## Sample Deliverables

... "The problem"
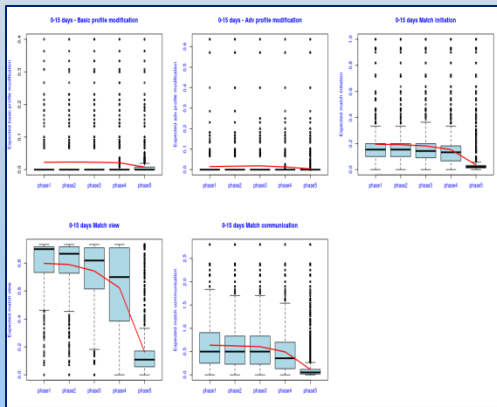


There is a drastic dip in the last phase of the customer free state in all categories. More than 0.5 in the expected activity per day !

Relevant recommendation by data analysis



Scores enhanced by preferences



Results enhanced by user preferences



Matching Results:

[1] "ref610"

For those matched profiles, a composite score is computed on these variables and the profiles are ranked accordingly

The engine further sorts and orders these profiles on the following parameters

Family value, Family type, Family status, Complexion, Body type

http://insights.aaumanalytics.com:8081/genisights/portfolio/home.jsp

# Case Study : Analytical support for a major television network

**Project Context:**
Our client, a national television network approached us to derive analytical insights by slicing and dicing multiple scenarios to help the top management to arrive at actionable results.

**AAUM's Contribution:**
- Understanding of target audience, frequent respondents and provision to reward the most loyal respondent (Integrated over a period of time)
- Respondent behavioral characteristics - by age group, gender, voice/non voice
- Media campaign/promotions efficacy - What time is better, Which channel is better?

**Sample Deliverables**

... extracted insights by dimensional analysis
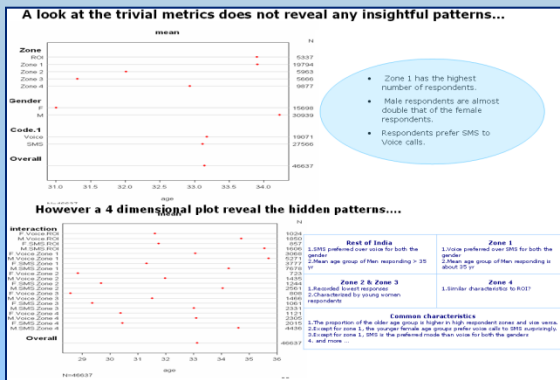
... chennai's female population are older than other vital circles
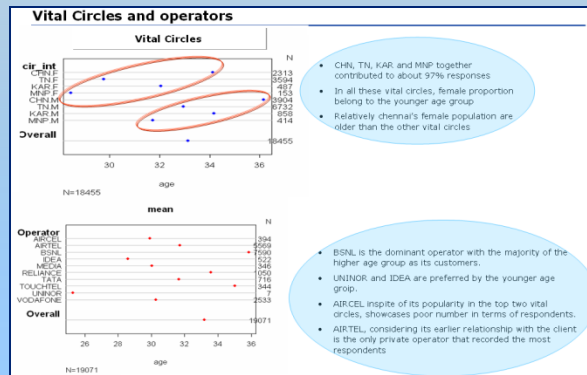
....analysis strengthened the media channel to reward the loyal customers.
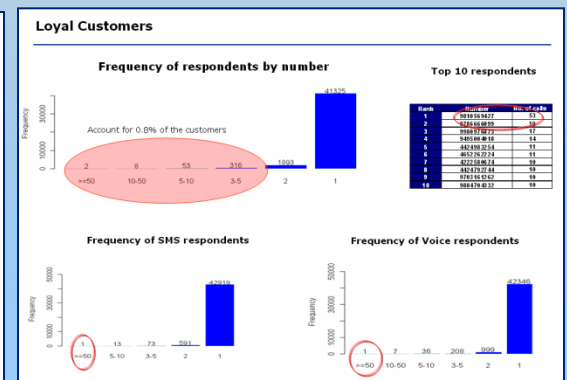
# Case Study: Developed KPI's and Predictive Analytics for a HR Consulting firm

**Project Context:**

Our client, a HR consulting firm, approached AAUM to develop comprehensive metrics which could be standardized across its clients

**AAUM's Contribution:**

- Developed standard metrics that could be rolled out across to the clients of the consulting firm
- Performed interaction analysis for 'key metrics' to derive a holistic understanding
- Developed predictive models for some very useful parameters

## Sample Deliverables

### Standardized metrics were defined and developed

**Metrics definition**

| S.No. | Metric | Definition | Interpretation |
|---|---|---|---|
| 1. | a. Productivity in days | Total number of working days of the employee/ total number of expected working days | This metric will range from 0 to 1. The closer the value is to 1, the higher the productivity. |
| 2. | Average leave day | Average of the difference between leave reporting date and leave availed date. | Ideally this metric should be closer to zero. A higher deviation implies the gross indiscipline |
| 3. | Swipe Indiscipline (including OD) | No. of days not swiped/ Total working days (including OD) | This metric will range from 0 to 1. Value closer to 0 implies a good scenario. |
| 4. | Swipe Indiscipline (discounting OD) | No. of days not swiped/ Total working days (excluding OD) | This metric will range from 0 to 1. Value closer to 0 implies a good scenario. |
| 5. | Swipe OD discipline | No. of OD swiped/Total number of OD | This metric will range from 0 to 1. The closer the metric is to 1, the better it is. |
| 6. | OD indiscipline | No. of rejected OD/Total number of OD | This metric will range from 0 to 1. Value closer to 0 implies a good scenario. |
| 7. | Regularization Rejected (RR) | No. of rejected regularization/Total no. of regularization requested | This metric will range from 0 to 1. Value closer to 0 implies a good scenario. |

### Interaction analysis of key metrics was performed and insights were derived

Metric 1. Productivity in days ...

Interactions

Productivity of T grade employees in Unit 5 and Seamless department depict a relatively lower productivity
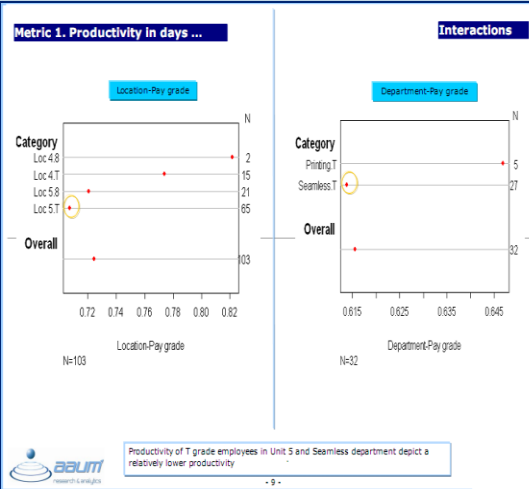
### Predictive models were built using Random Forests for key parameters

Predicting the productivity of the employee

**Inferences**

Our new random forest model indeed showed up 100 % accuracy in classifying the productivity parameter correctly.

The variables retained in our model are

- Department_new
- Not.swiped.including.OD,Experience
- LAFF.Metric
- LD.Metric

Cross segment ratio = 1

This model can be used to predict the productivity of the employee

# Case Study: Analytical support for a major ticket booking company
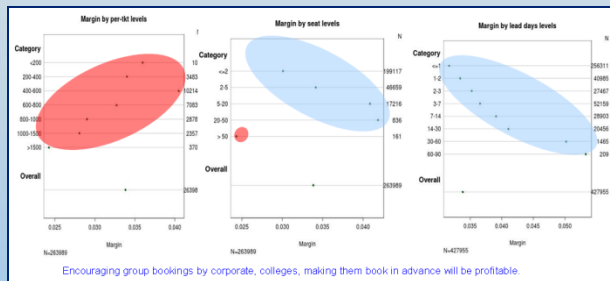
**Project Context:**
Our client, a major ticket booking company approached AAUM to provide comprehensive analytical insights to help the top management to arrive at actionable results.

**AAUM's Contribution:**
- Developed RFM metrics to help the management to effectively segment customers and reward them.
- Performed cohort analysis to qualify the churning, effective engagement with agents.
- Qualified traveler's behavioral patterns on routes, regularity, age, gender, per ticket value, lead days, etc.
- Developed dynamic pricing strategy based on the unfilled inventory levels.

**Sample Deliverables**

### Margin analysis …



Encouraging group bookings by corporate, colleges, making them book in advance will be profitable.

### RFM …      acquisition …



### Cohort analysis to qualify churn & engagement disengagement levels …



Deteriorating engagement levels after 3 quarters since registration.
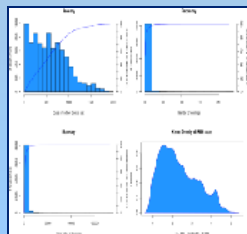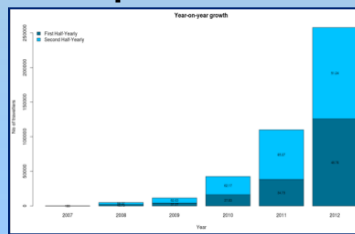
# Case Study: Analytical support for the largest integrated travel and travel related financial services company
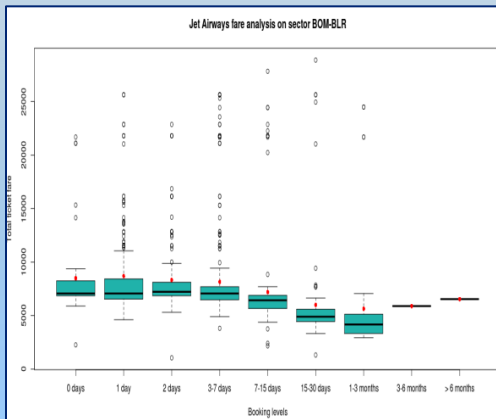
**Project Context:**

Our client approached AAUM to offer effectively qualify their business operations with insights from data analysis.

**AAUM's Contribution:**
- Devised methodology to effectively qualify the payment cycle, ageing metrics, outstanding from customers.
- Performed credit limit analysis, qualified credit consumption patterns and suggested efficient methodologies.
- Performed fare analysis to optimize the travel offerings to customers.
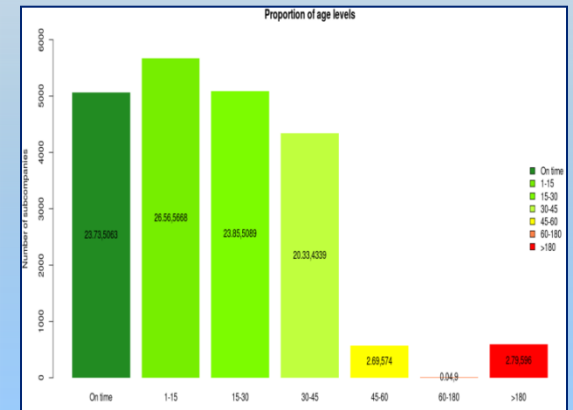
**Sample Deliverables**

**lead analysis on ticket fare of airline travel …**

**credit consumption and breaching patterns …**
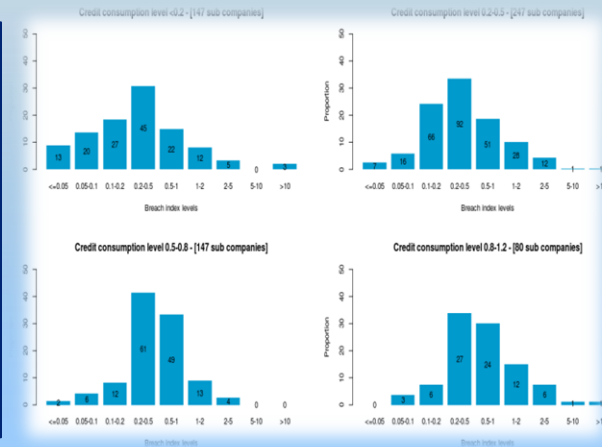
**promptness in payments …**

# Case Study: Efficient algorithms to analyze big data based on rich client engagements

**Project Context:**

Based on various big data assignments and research, Aaum has come up with efficient ways to handle big data using state-of-the art memory mapping techniques and parallelization techniques

**AAUM's Contribution:**

- Effectively crunched the big data problem using memory mapping techniques
- Parallel computing framework to run programs across machines/CPU's for 10X reduction in execution time

**Sample Deliverables**

**12 GB Data allocated to shared memory and memory mapped files used to perform analysis instead of using RAM memory...**

**Bootstrapping algorithms are run parallel on multiple clusters to bring down execution time...**

**in 2 seconds!!!**

| What is the maximum travelled distance in the data base ? | Submit | Result: 4983 |
| | | Time: user system elapsed 0.276 0.096 0.372 |
| What is the mean of the air time ? | Submit | Result: 102 |
| | | Time: user system elapsed 0.228 0.060 0.289 |
| What is the Range of the actual elapsed time ? | Submit | Result: -719 , 1883 |
| | | Time: user system elapsed 0.592 0.048 0.639 |

| Sequential running | Submit | The time taken to perform bootstrapping with ordinary sequential running is given here. Time: [1] 5.368 |
| Parallel bootstrapping with 2 clusters | Submit | The time taken to perform parallel bootstrapping with two slaves are given here. Time: [1] 3.291 |
| Parallel bootstrapping with 4 clusters | Submit | The time taken to perform parallel bootstrapping with four slaves are given here. Time: [1] 2.666 |

**\*System configuration:** **CPU**: Intel(R) Core(TM)2 Duo CPU E7500 @ 2.93GHz **Memory**: 8GiB

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# Case Study: Cloud based BI dashboard/reporting solutions for various clients

**Project Context:**

Aaum offers cloud based BI dashboards/reporting solutions to its clients.

**AAUM's Contribution:**

- The team builds BI/dashboard environment specific to clients on an EC2 instance hosted at AWS.
- Provision to switch on/off the instance at the click of a button to save the running costs.

## Sample Deliverables

**Launching cloud reporting interface as and when required ...**



**Reporting applications are deployed on the instance....**



**BIRT reports to provide insightful dashboards to the client....**

# Case Study: Lodging analytics for leading global lodging solutions company
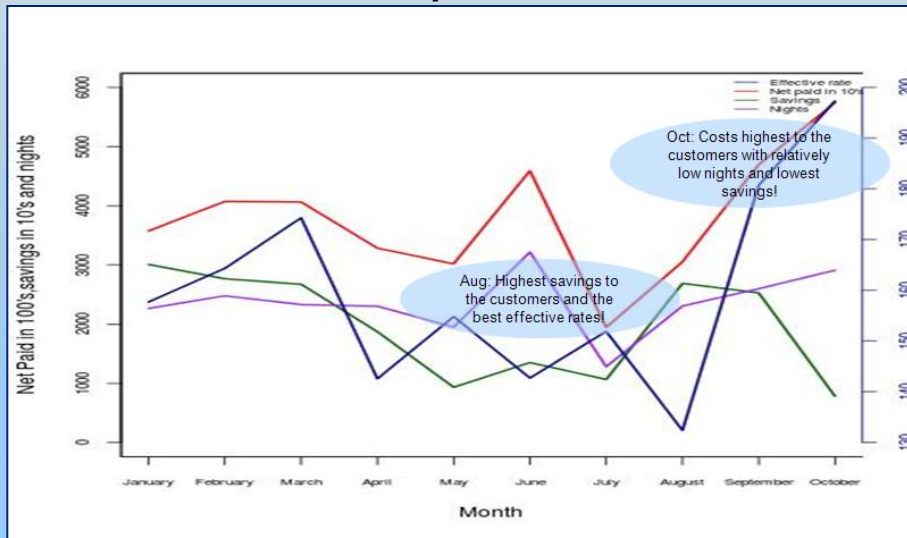
**Project Context:**
> AAUM offered analytical support to a leading global lodging solutions company to leverage their business.
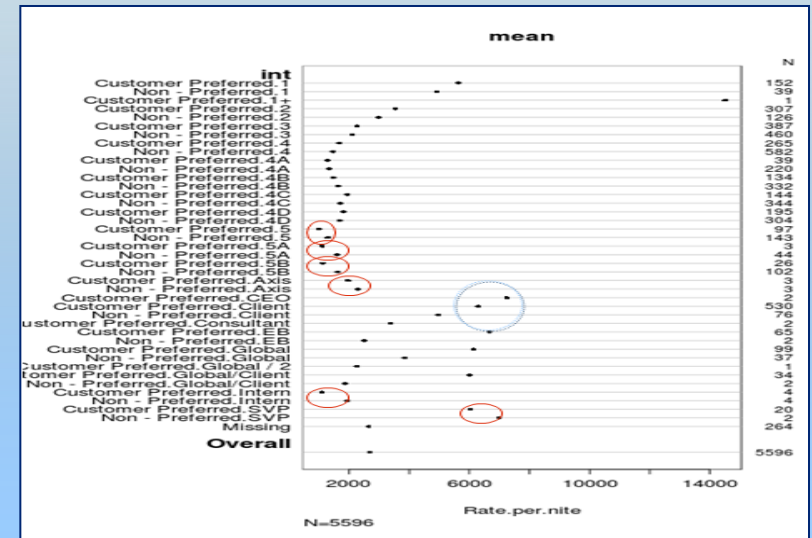
**AAUM's Contribution:**
- Slicing and dicing of data to understand customer's hotel booking preferences qualified on savings, effective rate and net paid.

## Sample Deliverables

**Trend analysis to understand the effective rate pattern in a year ...**



**effective rates over customer preference, location, position, etc ...**

# Case Study: Measuring the movie performance by mining social media sentiments
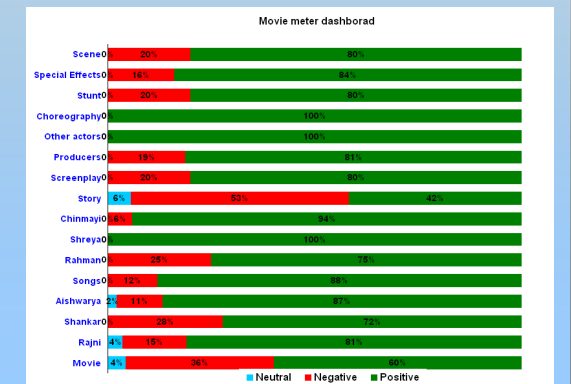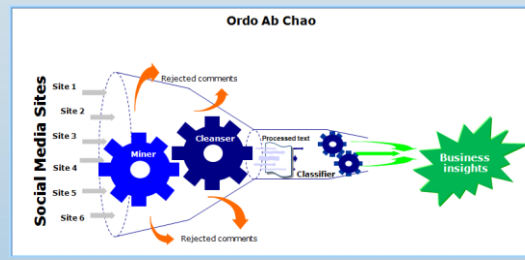
**Project Context:**
Research project funded by the company to devise a performance dashboard on various attributes for a movie to predict the success at the Box office.

**AAUM's Contribution:**

- Team AAUM extracted and analyzed the information from the web sources like YouTube and twitter to achieve the specified Business Objectives
- Developed dashboards for various attributes and analyzed the trends in the sentiment scores by using clustering, classification techniques.

## Sample Deliverables

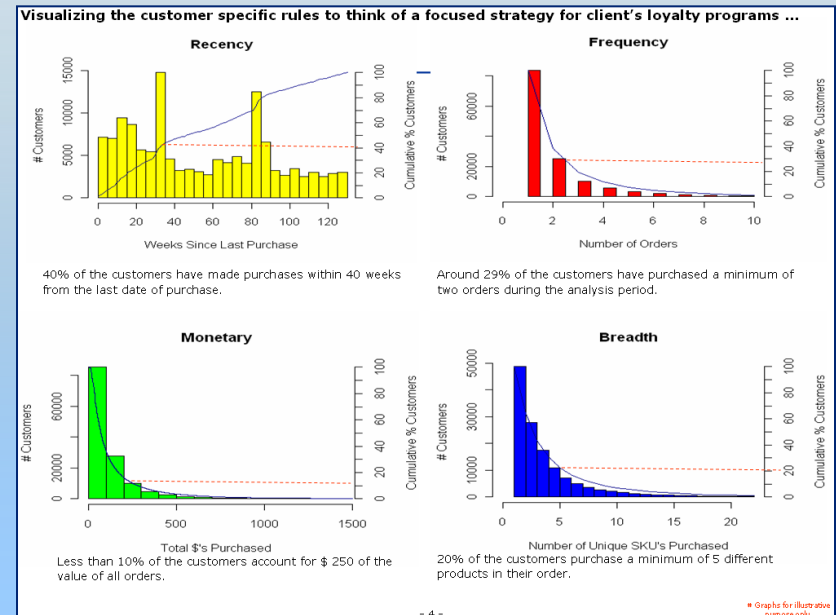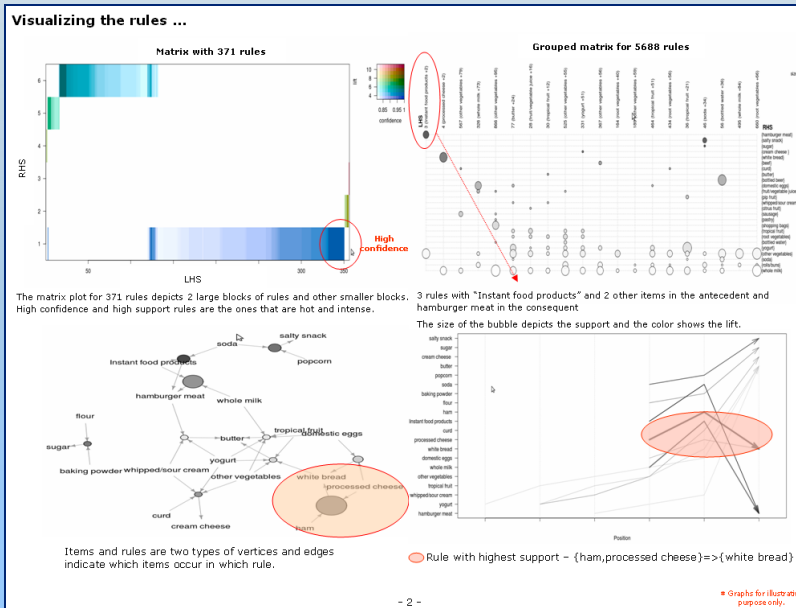# Case Study: Market Basket Analysis and Loyalty program

**Project Context:**

Our client approached us to develop a framework to analyze the transaction data of their customers and tie these insights with loyalty card program and reward their customers by their preference and loyalty factor.

**AAUM's Contribution <Pilot demo>:**

- Mined association rules to provide strategic insights for cross-sell/up-sell opportunities
- Framed out loyalty management model for the client.

**Sample Deliverables**



Visualizing the rules …

**Matrix with 371 rules**

**Grouped matrix for 5688 rules**

The matrix plot for 371 rules depicts 2 large blocks of rules and other smaller blocks. High confidence and high support rules are the ones that are hot and intense.

3 rules with "Instant food products" and 2 other items in the antecedent and hamburger meat in the consequent

The size of the bubble depicts the support and the color shows the lift.

Items and rules are two types of vertices and edges indicate which items occur in which rule.

Rule with highest support – {ham,processed cheese}=>{white bread}



Visualizing the customer specific rules to think of a focused strategy for client's loyalty programs …

**Recency**

**Frequency**

40% of the customers have made purchases within 40 weeks from the last date of purchase.

Around 29% of the customers have purchased a minimum of two orders during the analysis period.

**Monetary**

**Breadth**

Less than 10% of the customers account for $ 250 of the value of all orders.

20% of the customers purchase a minimum of 5 different products in their order.

# Case Study: Crime Analytics for Tamil Nadu State Crime Records Bureau

**Project Context:**

Our client, police Department archived the crime data for the past ten years and approached AAUM to deliver insights by performing appropriate analytical techniques.
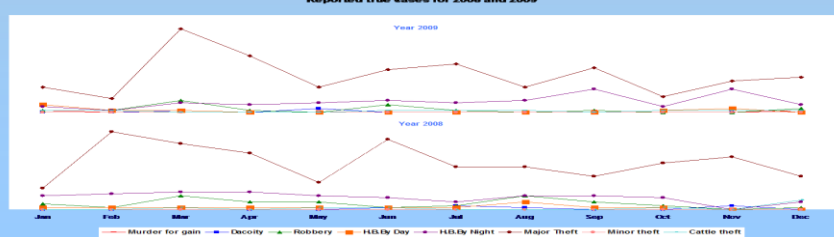
**AAUM's Contribution:**
- Discovered hotspots of crimes by cluster analysis of the historic data.
- Trend analysis of different crimes
- Mining insights from the police records by text mining
- Derived KPIs for crime department to monitor the crimes.

**Sample Deliverables**

Hot Spots found out for crimes in Chennai city.



Trend movement for each type of Crime



## Mining insights from the comments recorded



- An arrest was involved in 63% of the murder cases.
- In around 6% of the cases the deceased were unidentified.
- The arrested were remanded for about 54% of the cases.

- The stolen property was recovered in 70% of the cases.
- The victims were robbed of cash in 74% of the cases. For 84% of these cases the victims were robbed of property and cash.
- In 86% of the cases, the accused committed theft by threatening the victims with a knife.

- The stolen property was recovered in 67% of the cases.
- The accused was arrested in 75% of the cases.

- The culprit is unknown in 75% of the cases.
- From the plot and the rules it is evident that for 55% of the cases, the theft was committed by breaking down the lock.

# Case Study: Predictive model to grade the performance of DCCBs

**Project Context:**
> Developing Business intelligence and analytical capability for a leading rural bank

**AAUM's Contribution:**
- Analyzed current BI maturity with comprehensive data analysis of the customer datum collected by our client
- Evaluated and suggested comprehensive plan for BI maturity
- Identified as strategic partner to perform predictive analytics in multiple phase spanning two years

### Sample Deliverables



to reveal Expense Insights at aggregate level



to reveal customer profile at aggregate level
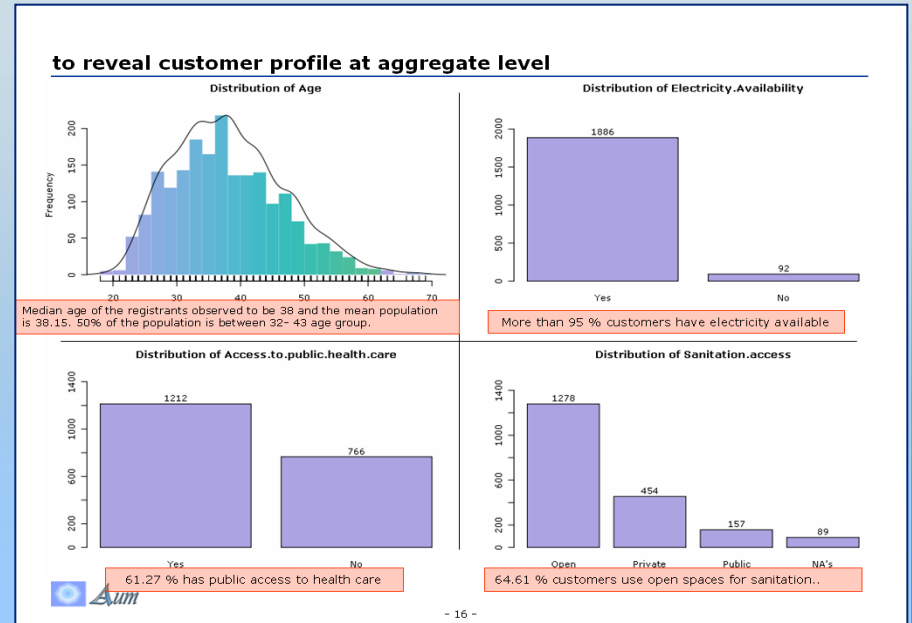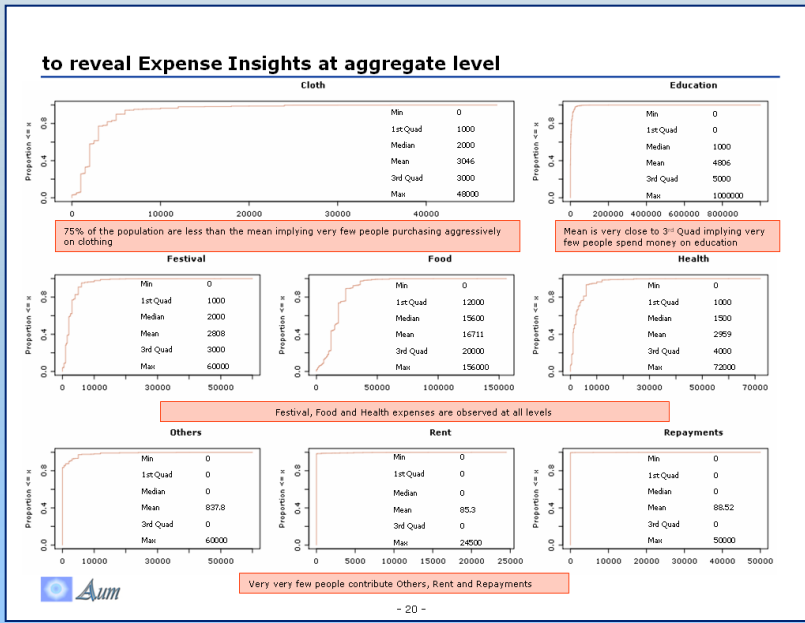
# Case Study : Analytics on data collected by a rural research firm

**Project Context:**
Our client has collected valuable data through their Kiosks and wanted to derive insights which can identify new potential business for rural India
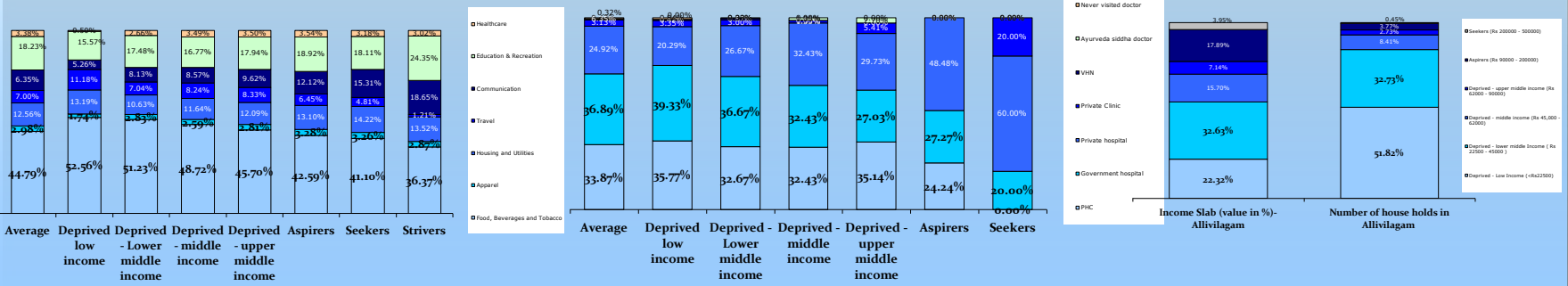
**AAUM's Contribution:**
- AAUM profiled the villages and identified clusters
- Thorough analysis done for seven villages in three districts based on income slabs adopted from NCAER & Mckinsey report
- Identified new businesses which would flourish once the villagers migrate to higher income slabs

**Sample Deliverables**

As the villagers start earning more they will spend on communication and health care ….

….and they prefer private hospitals.

More than 50% of villagers in Allivilagam earn less than Rs. 22,500 per annum

Data Management: Seamless and secure data transfer using client infrastructure. More than 20 MB of raw data was cleansed and analyzed using tools available in excel.

# Case Study: Building Claims Analytics solutions for Healthcare
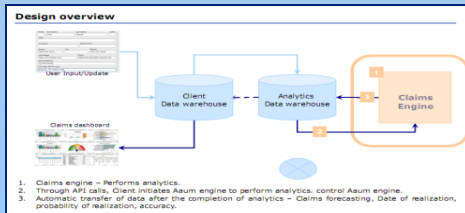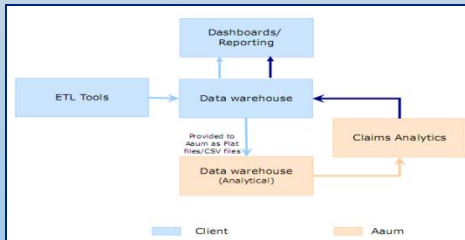
**Project Context:**

Our client approached AAUM to build and implement analytical models for their Healthcare Claims Intelligence and Insights solution that was targeted at US Healthcare providers

**AAUM's Contribution:**

- A workflow and architecture for the claims engine was designed after interactions with the client
- Comprehensive collection of data from the client was undertaken to frame the input for the model
- Based on the design and data, the model was built with flexibility to be customized across client requirements

**Sample Deliverables**

**Workflow and architecture of the claims engine were designed**

**Claims, Provider, Billing team and call data were used as input variables to build the model**

**The outcome of the approach was a model which could be customized as per client requirements**
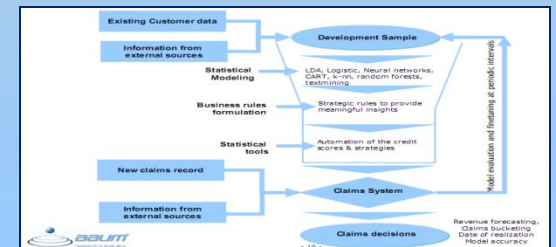
# Case Study: Credit scoring framework for Micro Finance Institutes (MFI)

**Project Context:**

   Our client wanted Aaum to evaluate and identify a suitable credit scoring framework for scoring MFIs

**AAUM's Contribution:**

- Aaum presented a white paper evaluating various credit scoring methodologies
- Plan in progress for solution implementation.

## Sample Deliverables

**Credit reporting contains consumer specific information which aids lenders and other organizations to make qualitative decisions ...**



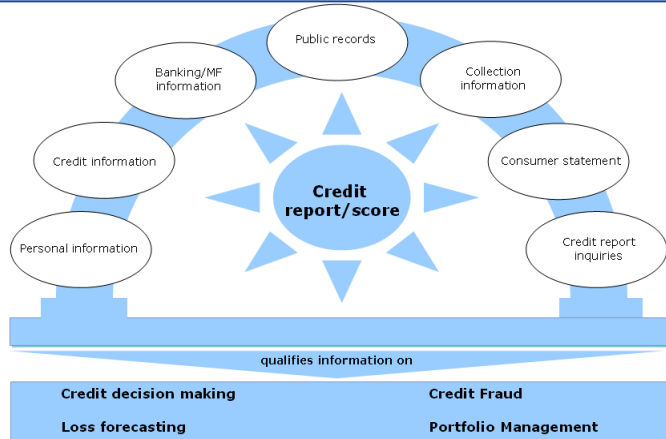- Public records
- Banking/MF information
- Collection information
- Credit information
- **Credit report/score**
- Consumer statement
- Personal information
- Credit report inquiries

qualifies information on

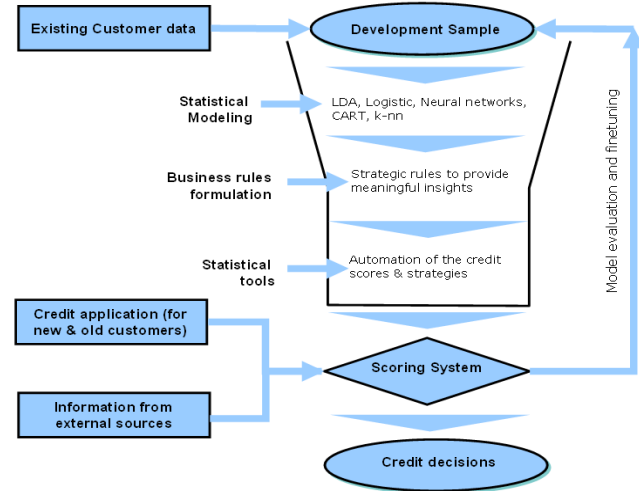| | |
|---|---|
| **Credit decision making** | **Credit Fraud** |
| **Loss forecasting** | **Portfolio Management** |

... Credit assessment is currently based on insufficient data simply because information on total credit exposure is not maintained at a central point. This severely limits the scope of these credit risk assessment processes.

Credit Information Bureau (India) Limited Source: http://www.cibil.com/consumer.htm

- 3 -

**Devising a scoring framework would elucidate objective with right approach to modeling , rules formulation & statistical tools selection**



- Existing Customer data → Development Sample
- Statistical Modeling → LDA, Logistic, Neural networks, CART, k-nn
- Business rules formulation → Strategic rules to provide meaningful insights
- Statistical tools → Automation of the credit scores & strategies
- Credit application (for new & old customers)
- Information from external sources → Scoring System
- Credit decisions

Model evaluation and finetuning

- 7 -

# Case Study: Business intelligence dashboard

**Project Context:**
>    Our client approached Aaum to build cost-effective analytical dashboards to reap the benefits of analytical insights for their business activities.

**AAUM's Contribution:**
- Customized analytical dashboards specific to client business
- Dashboard and reports developed and customized specific to roles.
- Appropriate KPIs and metrics generated specific to the client business.
- Ability to store reports in multiple formats

**Sample Deliverables**

**Dashboard and reports were developed/deployed specific to roles ...**

**Enriched with reports, KPIs and information as per user privileges ...**

**Multiple possibilities to store content in the format desired by the business ...**



Dashboard and reports were developed/deployed specific to roles



Enriched with reports, KPIs and information as per user privileges
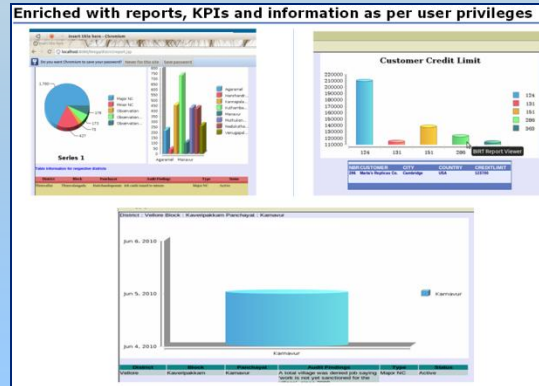


Multiple possibilities to store content in the format desired by the business
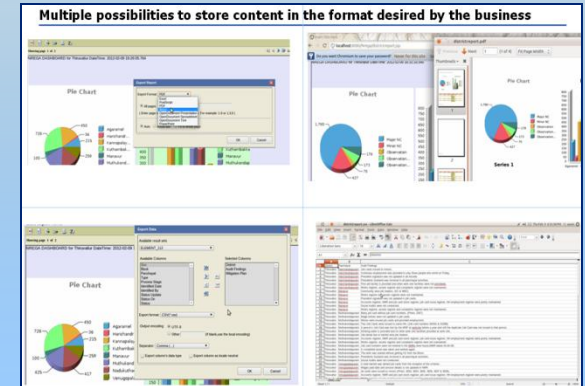
# Case Study: Design & delivery of innovative financial products for empowering SHG

**Project Context:**
Aaum is developing the individual credit scoring model in partnership with NABARD, National banks, Government, NGOs to grade individuals/SHGs.

**AAUM's Contribution:**
- AAUM team simplified the process with no physical requirement to travel physically to SHG/NGO locations.
- The team is devising credit score algorithms and configured in the server to perform automatic scoring.
- The entire model is getting deployed in the mobile phone to facilitate quick reach in the remote places.
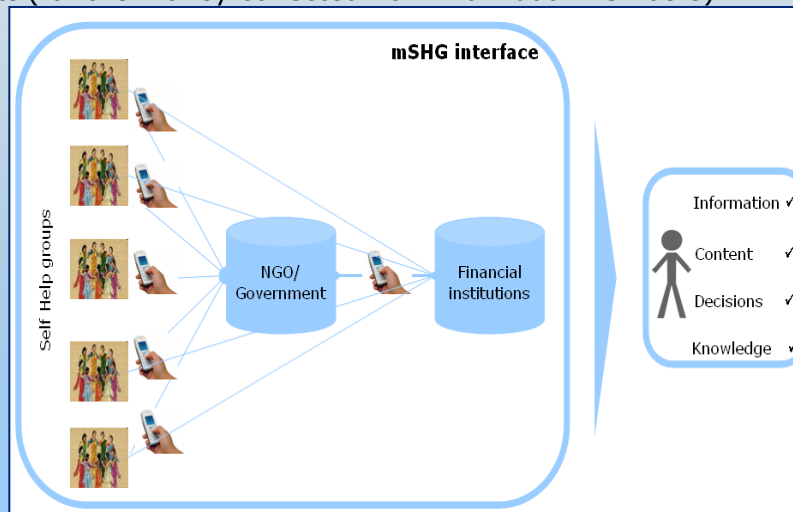
## Sample Deliverables

The system would captures all receipts (for the money collected from individual members)
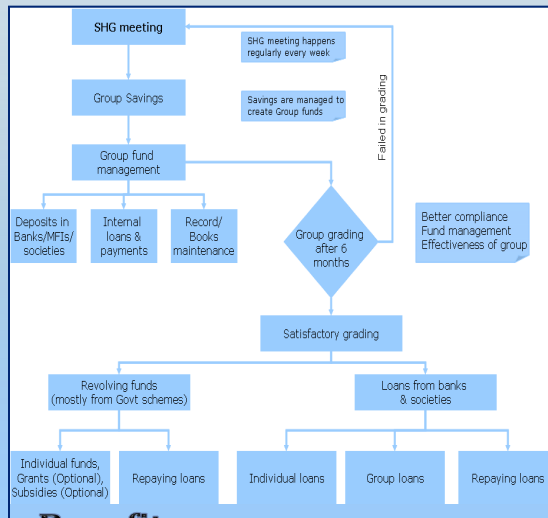


**Benefits:**
- Big socio-economic impact by strengthening the SHG-credit linkage by connecting NGO`s, Banks, MFI`s, Cooperatives and Societies, Linking Government, Banks And State Government.

# Case Study: Geographic Dispersion of Business Risks for a financial institute
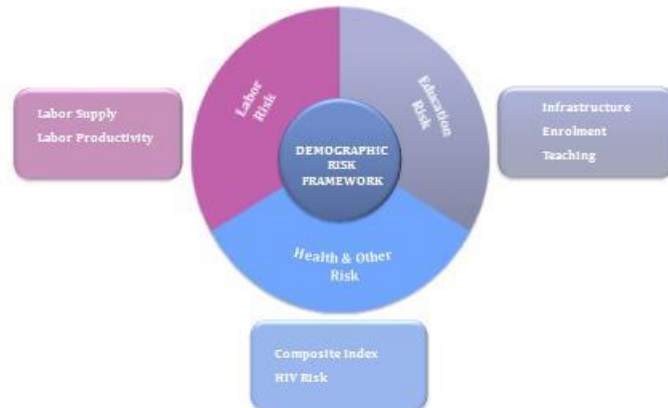
**Project Context:**
Our client wanted AAUM to build geographical dispersion of business risks in India

**AAUM's Contribution:**
- AAUM identified the variables needed to build risk at a location and created demographic risk framework
- AAUM used demographic risk frame work and identified risks for 60 districts in 18 states in India

**Sample Deliverables**



We assessed geographical dispersion of risks along 3 components, namely labor, education and health & other



Risk is estimated for 60 districts in 18 states across India

# Questions/Feedback?

## Contact us

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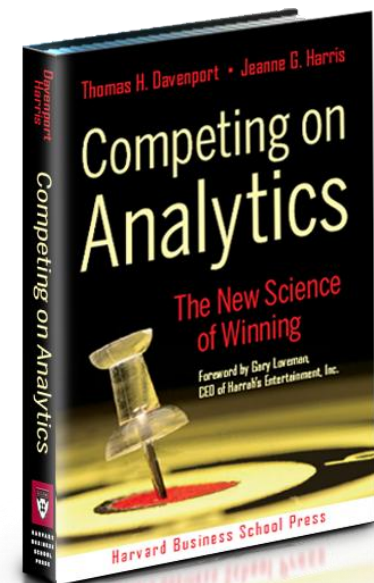
**Aaum's office at IIT Madras Research Park**

## About Aaum

Aaum Research and Analytics founded by IIT Madras alumnus brings in extensive global business experience working with Fortune 100 companies in North America and Asia Pacific. Established at IIT Madras Research Park with a focus on researching and devising the sophisticated analytical techniques to solve the pressing business needs of corporations ranging from travel & logistics, finance, insurance, HR, Health Care, Entertainment, FMCGs, retail, Telecom.

Thomas H. Davenport • Jeanne G. Harris

**Competing on Analytics**

The New Science of Winning

Foreword by Gary Loveman, CEO of Harrah's Entertainment, Inc.

Harvard Business School Press

"Organizations are competing on analytics not just because they can- but because they should…"

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