OR Practice in the Philippines

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Where is the Philippines?

• The Philippine OR community is small and active.
• The IFORS Survey gave us an opportunity to benchmark local OR practice with that of the rest of the world.
The IFORS Community consists of the NORAM, ALIO, EURO and APORS regions.
The Philippines is a small part of APORS
The Philippines is a small part of APORS with the OR community concentrated in the national capital region.
OR applications in the Philippines

Application areas of your OR work

- Finance
- Marketing
- Production Management
- Logistics
- Supply Chain Management
- Project Management
- Consumer
- IT
- Service Operations
- Strategic Planning
- Personnel Management
- Marketing
- Project Management & Control
- Logistics and Supply Chain
- Personnel and Manpower Planning
- Strategic Planning
- IT
- Service Operations

Number of responses

- Finance: 3
- Marketing: 4
- Production Management: 6
- Logistics: 6
- Supply Chain Management: 7
- Project Management & Control: 7
- Consumer: 5
- IT: 5
- Service Operations: 4
- Strategic Planning: 3
- Personnel Management: 3
- Marketing: 3
- Project Management: 4
- Logistics: 5
- Supply Chain Management: 6
- Personnel and Manpower Planning: 6
- Strategic Planning: 5
- IT: 5
- Service Operations: 4
Where is the Philippines in terms of OR application areas as a % of total projects?

[Bar chart showing the distribution of OR application areas for the Philippines, APORS, and ALL]
Philippines has the least size of OR respondent groups within the region.
Local academic consultants augment the small size and help train in-house analysts.
Philippines is a part of the APORS grouping

<table>
<thead>
<tr>
<th>Asia Pacific Country</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>8</td>
</tr>
<tr>
<td>China</td>
<td>3</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
</tr>
<tr>
<td>Jordan</td>
<td>1</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
</tr>
<tr>
<td>New Zealand</td>
<td>7</td>
</tr>
<tr>
<td>Philippines</td>
<td>9</td>
</tr>
<tr>
<td>Singapore</td>
<td>1</td>
</tr>
<tr>
<td>UAE</td>
<td>1</td>
</tr>
</tbody>
</table>
Analyst respondents have been in OR for more than 10 years

**Years in OR (APORS)**

<table>
<thead>
<tr>
<th>Years</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 years</td>
<td></td>
</tr>
<tr>
<td>3-5 years</td>
<td></td>
</tr>
<tr>
<td>6-10 years</td>
<td></td>
</tr>
<tr>
<td>11-20 years</td>
<td></td>
</tr>
<tr>
<td>20 years more</td>
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</table>
and yet have been in their organizations for less than 5.
Philippine data also suggests mobility of OR workers across organizations.
Spreadsheet modelling is most popular tool used in practice.

**Usage of OR related software (APORS)**

- Excel: 6 responses
- CPLEX: 3 responses
- R: 2 responses
- MATLAB: 3 responses
- ARENA: 3 responses
- COIN-OR: 2 responses
- SAS: 1 response
- XPRESS: 1 response
- VBA: 1 response
- LINGO: 1 response
- Visual C++: 1 response
There are some tools that are not used.

- Excel
- CPLEX
- R
- MATLAB
- ARENA
- COIN-OR
- SAS
- XPRESS
- VBA
- LINGO
- Visual C++
Training on Software use and consulting skills are received by analysts

On-the-job training (APORS)

<table>
<thead>
<tr>
<th>Skill</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR techniques</td>
<td>8</td>
</tr>
<tr>
<td>Statistics</td>
<td>14</td>
</tr>
<tr>
<td>Software packages Consultancy skills eg report writing, presentation</td>
<td>16</td>
</tr>
</tbody>
</table>
Local responses follow the regional trend.
All techniques are used and understood...

Your Personal Understanding and Use of OR and related techniques
Top 8 techniques

- Optimisation - Discrete methods, including MP, LP, IP, DP, Heuristics
- Spreadsheet modelling - basic
- Statistical analysis - basic, including probability
- Forecasting
- Simulation, including discrete event, agent based
- Spreadsheet modelling - advanced, including VBA
- Inventory models
- Optimisation - Stochastic
…except for Problem Structuring Methods

Your Personal Understanding and Use of OR and related techniques

Next 8 techniques

- Scheduling
- Decision Support Systems
- Project management and control techniques, including CPS, CPA, PERT
- Queuing models
- Statistical analysis - advanced, including multivariate
- Strategic Planning, including Cost Benefit Analysis, Performance Management, Balanced scorecard, scenario planning
- Game Theory
- Decision analysis, including MCDA (multi-criteria decision analysis)
Question: Barriers to the use of OR

- **Cost:** staff; training; software; hardware
- **Difficulties:** lack of qualified staff; OR software inadequate/difficult to use
- **Client/Mgt:** cannot support OR; unconvinced of benefits; lack of awareness; lack of understanding; org culture not suited to OR

1 = not important       3 = important       5 = very important
Lack of awareness is reported as the greatest barrier to use of OR in the region.
Data limitation was considered a major obstacle followed by lack of awareness.
What’s in the Name?

*Logistics, Corporate Engineering, Strategic Planning
Respondent affiliations indicate greater OR activity in the Service vis-a-vis Product Sector.
The Local OR Community in the Philippines

Philippine OR workers constitute a small but active group who are members of the national OR society.
The Operations Research Society of the Philippines

- Founded in 1987 through the efforts of the practice sector, specifically, SMC OR
- Issues regular newsletters and the PJOR.
- Established the ORSP Corps as part of its commitment to nation-building.
- Holds regular forums for the continuing education of OR professionals
Membership in the Society consists of people from practice and the academe.

**Composition of ORSP Membership**

- Industry: 36%
- Academe: 64%
Practitioners come from varied industries.

- Manufacturing: Food and Beverage, Semiconductors
- Services: Food Industry, Management Consulting, Banks, Insurance companies, Distribution, Software
- Energy – Power, Mining, Oil Refining
- Government and NGOs
Practitioners come from varied industries.
Profile of industries have not changed significantly over 6 years.
Known OR applications vary per industry sector.

- Energy sector – refinery applications
- Food services – Queuing, Outlet Locations, TV Ad Placements
- Financial – Portfolio management
- Distribution – Warehouse location; Routing
- Services – Revenue Management
- Semiconductors – Equipment utilization; Manpower planning
- Food and Beverage – all of the above
There are only a few organizations with formal/quasi-OR units in the Philippines.

- **Private Sector**
  San Miguel Corporation, Kentucky Fried Chicken, Jollibee Foods, Zuellig Pharma, Analog Devices, Bank of Philippine Islands, Oil companies (Caltex and Petron), Intercontinental Hotels, Optimization software firms, formerly: Philippine Long Distance Telephone Co., Philippine Airlines

- **Public Sector**
  National Food Authority, Social Security, System, National Economic and Development Authority, Dept of Trade and Industry
But OR-type analysis is happening elsewhere. . .

- For internationally-funded (ODAs) infrastructure projects
- Within a multinational Insurance and risk management company
- For development studies sponsored by international organizations
- Within the National Economic Development Authority and the National Statistical Coordination Board
Interviews indicate quantitative analysis in use in the public . . .

- Macro econometric models are estimated and used to conduct policy simulations and generate forecasts for the economy.
- Single equation models used to predict poverty status of households.
- Multinomial logit model in travel mode choices, simulation models based on the 4-step transport demand function (trip generation, trip distribution, modal split, traffic assignment), spatial computable general equilibrium model, regression analyses, multi-criteria optimization, etc.
And private sectors . . .

- Models for risk quantification and/or management, asset-liability management, merger and acquisition activities
- Risk management, pricing of insurance products, valuation of liabilities.
Training of people doing analysis

- Economics
- Statistics
- Actuarial Science
- Transportation Engineering
Barriers to use of quantitative models

- Philippines a protected economy
- Decision-makers’ aversion to Math
- Lack of qualified personnel
- Lack of awareness
- Misuse of models – calibrating to yield desired results; dismissing if not what was wanted.
- Political rather than objective decisions.
The Local OR Practice in the Philippines

- Is limited to a handful of companies
- Is rarely known as OR, function found in the Industrial Engineering Department, Technical Services, Management Services or Corporate Planning
- Is a small community associated with the national OR Society
- Has opportunities to link with other related fields in practice
The Local OR Practice in the Philippines

- Has a definite but limited presence.
- Shows strong relationship with the academic sector.
- Is mostly found in the service, inclusive of distribution sector, but beginning to see presence in the outsourcing industry.
- Is still hampered by data limitations and lack of awareness by clients.