Management information systems for microfinance institutions: the U-shaped features-scale curve

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• Exists a U-shaped Functionality-Scale curve specific to management information systems for microfinance institutions;

• The left side of the curve is sloping downwards MFI switch from manual MIS to semi-computerized (spreadsheets), then to low-end DB engines or self-developed software.

• Left side effect – tradeoff between Functionalities and Scale.

• Breaking point – acquisition of appropriate MIS MIS prevents 40% of MFI to achieve fixed goals, of these 60% are small.

• Right side effect - Scale and Functionalities are positively correlated.

• Question: Why the initial tradeoff? Is it bad? Has to be avoided? Solutions?
The Curve

Phases in practice:
1. Tradeoff;
2. Breaking point;
3. (Exponential) growth.

Phases in theory:
1. (Constant) growth.
The Paper

<table>
<thead>
<tr>
<th>Client</th>
<th>MFI</th>
<th>Stakeholders</th>
</tr>
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</table>

The diagram shows a flow from Client to MFI to Stakeholders.
The tradeoff stage (1)

- **Stage 1 (manual)**
  - Almost unlimited number of data manipulations at lowest cost
  - Reporting the number of female borrowers is immediate
  - Changing a procedure or collecting new type of data is immediate.

- **The extra 2 steps (+ investments):**
  0. Investment in IT infrastructure (Hardware + Software);
  1. Conversion of information from paper to computerized data;
     - Data loss due to unsupported functionalities (photos, descriptions);
     + Computer assisted data treatment and generation of reports;
  2. Printing data / information on paper for reporting purposes.

- **Stage 2 (semi-manual):**
  - Built-in functionalities, possibility to use formulas and macros;
  - Facilitates scaling but imply a certain loss in functionalities;
  - New ratios - automatic calculation requires intervention of authorized specialized personnel that will update formulas or macros;
  - Limited to 5,000 loans per sheet (problem with 1 – many relationships).
The tradeoff stage (2)

- Stage 2 (semi-manual).

- The extra steps (+ investments):
  - Network;
  - Server;
  - DB software..

- Stage 3 (semi-automated):
  - Use of low-end database engines;
  - Centralized database / standardized forms;
  - No problem with one-to-many data relationships;
  - Interface required to work with data: queries and forms;
  - Access to raw data is impossible;
  - Even the procedure of counting current loans requires (hard) coding.

- Tradeoff: functionalities for possibility to continue (one-dimensional) scaling.
The breaking point (3)

- MIS based on low-end database engines + own development prevents the MFI from scaling at a faster pace.

- 40% of MFIs have their MIS preventing them from achieving MFI’s goals. Of these, 60% are institutions with less than 10,000 clients (CGAP, 2008)

- Breaking point intervenes when the MFI decides to acquire the appropriate off-the-shelf MIS.
The positive correlation stage

\( R^2 = 0.2627 \)
The positive stage & costs

\[ R^2 = 0.24 \]
The quality of the MIS


- The ISO Systems and software Quality Requirements and Evaluation (SQuaRE) identifies eight components of quality of MIS:
  1. functional suitability,
  2. reliability,
  3. operability,
  4. performance efficiency,
  5. security,
  6. compatibility,
  7. maintainability and
  8. transferability.
The quality data

- Functional suitability – the functionalities
- Reliability – proxy: the median level of the scale of clients \((\text{Max} - \text{Min})/2\)
- Operability – proxy: CGAP evaluation of “Ease of Use” of the MIS using a
  4-points scale (1 - poor, 2 – fair, 3 – good, 4 – excellent)
- Performance efficiency – excluded as compensatory
- Security – sum of S features (data encryption, back-up, tracking)
- Compatibility – data export / import tools + accounting integration
- Maintainability – modification (parameterization), D audit and repair tools
- Transferability – transfer from one operational environment to another: a score composed of: Server OS + Workstation OS + DB requirements +
## Linear regression

### R² = .76

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<th>Security</th>
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### R² = .78

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Thanks for your attention and comments!

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