RMIT UNIVERSITY

# Towards Tool-support for Sustainability Profiling

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# Sustainability in Software Engineering

## Individual

Individual needs should be protected and supported with dignity in a way to improves the quality of human life

## Social

Relationships should be equitable, diverse, connected and democratic

## Technical

Technology should be able to cope with the changes and evolution efficiently and with respect for natural resources

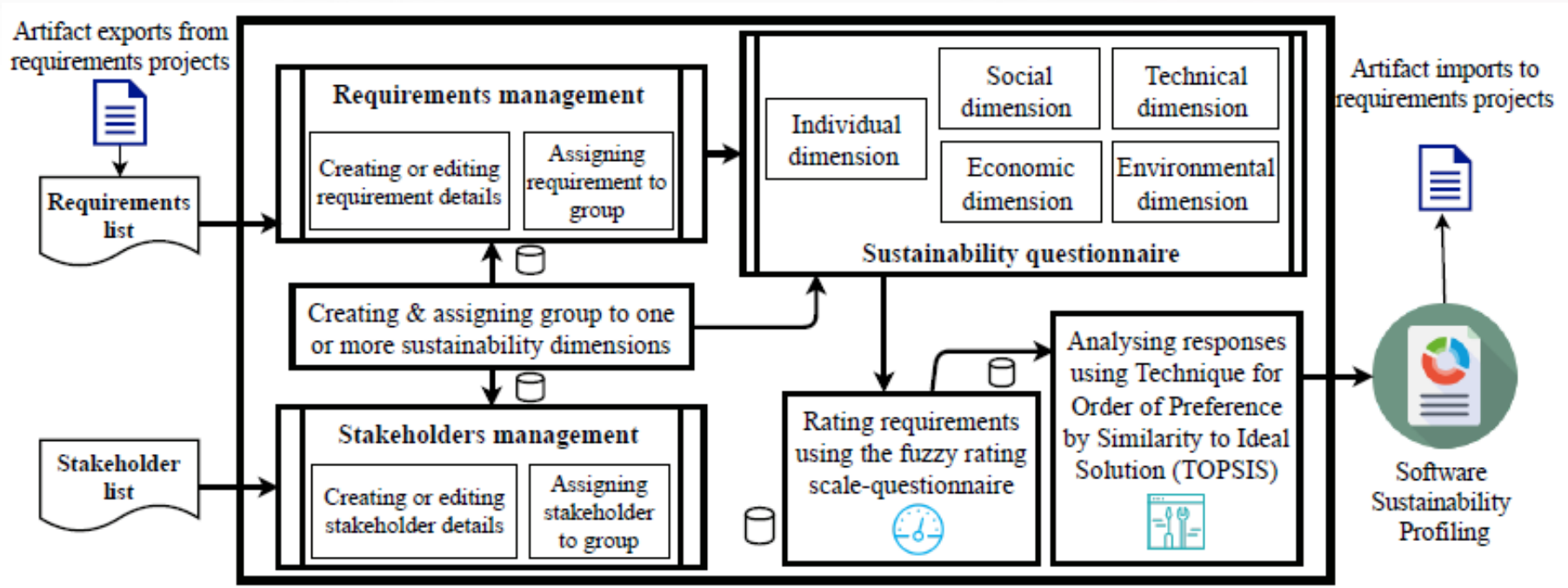
## Economic

A positive economic value and capital growth should be ensured and maintained

## Environmental

Natural resources have to be protected from human needs and wastes

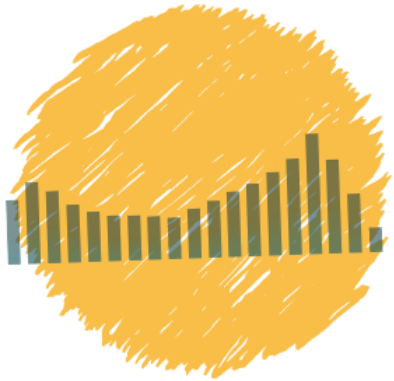
# SuSoftPro: Process Model



# SuSoftPro: Sustainability Profile


Sustainability rating

Sustainability aspects

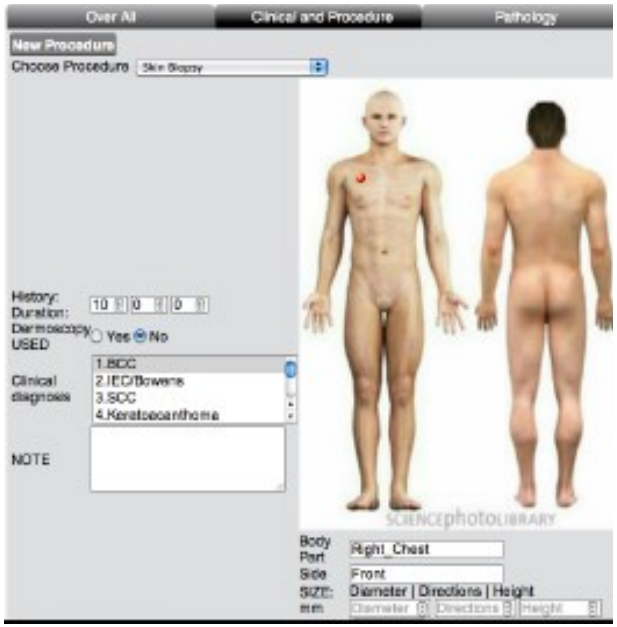


Sustainability requirements

**For further details and tool demo, please come to Poster Booth on Wed & Tue**

# Case Study: SCIS

- Skin Cancer Information System (SCIS)

# Sustainability Profiling for SCIS (1)

1. **Defining stakeholder groups**
   - 2 physicians,
   - 2 nurses,
   - 4 receptionists,
   - 3 administrators and Managers, and
   - 3 developers and IT Support.
2. **Defining questions**

   "Rate the influence of the requirement on the X sustainability",
3. **Defining requirements**
   - 23 high-level requirements specification

# Sustainability Profiling for SCIS (2)

## 4. Assigning Stakeholders

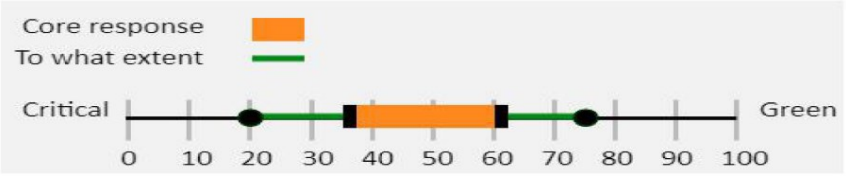
| Group | Sustainability Dimensions | | | | |
|---|---|---|---|---|---|
| | Individual | Social | Technical | Economic | Environmental |
| Physician | ✓ | ✓ | | ✓ | |
| Nurse | ✓ | ✓ | | | |
| Receptionist | ✓ | ✓ | | ✓ | |
| Administrator & Manager | | ✓ | ✓ | ✓ | ✓ |
| Developer & IT Support | ✓ | | ✓ | ✓ | ✓ |

# Sustainability Profiling for SCIS (3)

## 5. Rating Requirements

- 30 questions for nurses (2 dimensions)
- 45 questions for physicians (3 dimensions)
- 24 questions for receptionists (3 dimensions)
- 52 questions for managers (3 dimensions)
- 92 questions for IT people (4 dimensions)

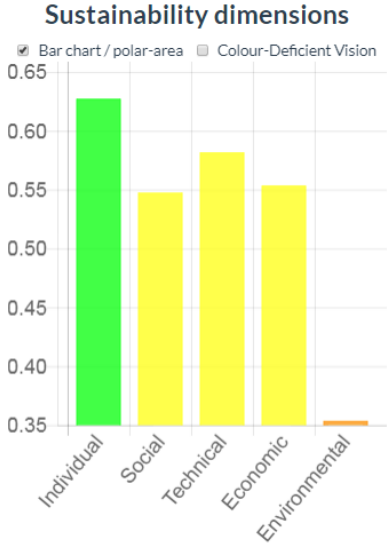
## 6. Analysing sustainability



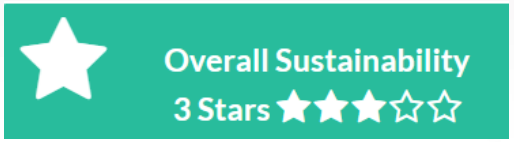

- Analysing only submitted and answered questions

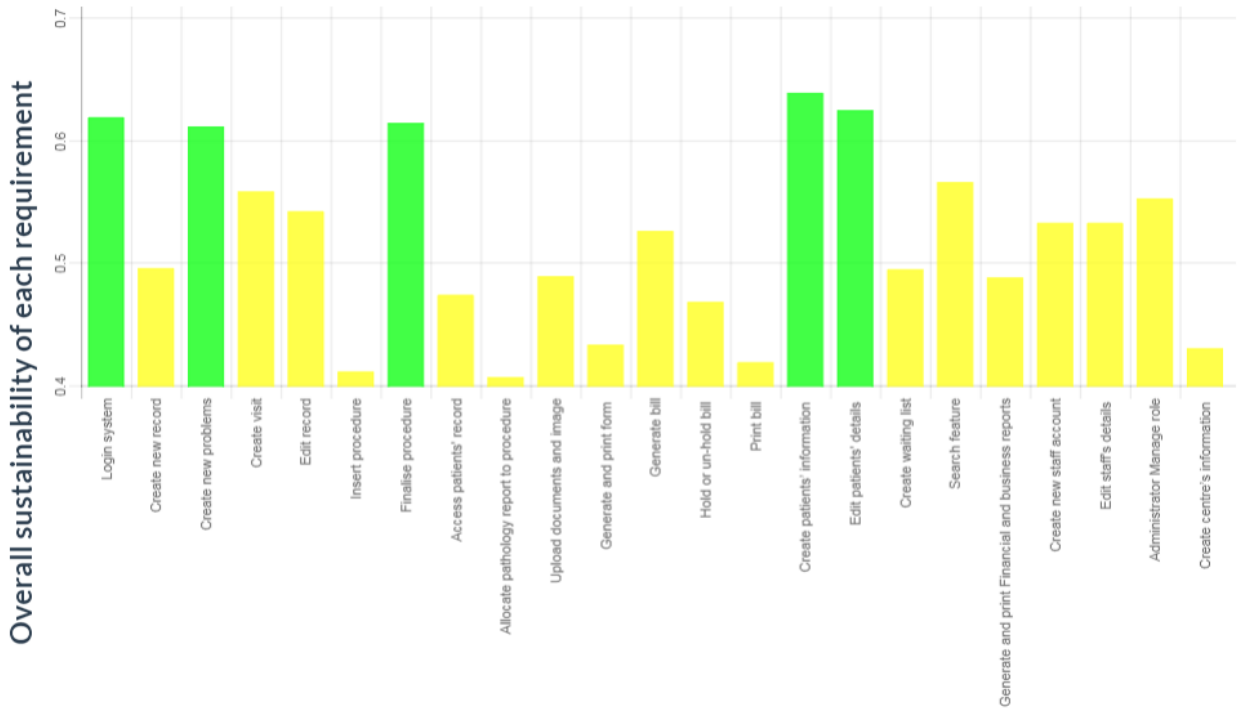
# Sustainability Profiling for SCIS (4)

## 7. Generating sustainability profiling




| Key Charts | | |
|---|---|---|
| Percentage % | Colour Code | Description |
| 80-100 | Dark green | Green (Vibrant) |
| 60-79 | Light green | Satisfactory |
| 40-59 | Yellow | Basic |
| 20-39 | Orange | Unsatisfactory |
| 0-19 | Red | Critical |



# Comparison: Procedure

- 3 criteria for selecting frameworks:
  - **Scope**: Developed for requirements engineering context
  - **Process**: Involved MCDA and stakeholders
  - **Objective**: Analysed sustainability.

- 9 sub-criteria:
  - Framework focus
  - Tool support
  - Collection method
  - Weight scale
  - Number of criteria for analysis
  - Analysis method
  - Computations
  - Participants
  - Rank update

# Comparison: Analysis & Result

| Examines Criteria | sureCM [5] | ReproTizer [7] | SuSoftPro |
|---|---|---|---|
| **Framework focus** | Requirement analysis: resolve conflict | Requirement analysis: prioritisation | Requirement analysis: sustainability |
| **Collection method** | Various methods | Online questionnaire | Online questionnaire |
| **Weight scale** | "natural numbers" (several scales are used) | "natural numbers" (scale from 1 to 5) | "rational numbers" (fuzzy rating scale) |
| **Analysis method** | TOPSIS | WADM | TOPSIS |
| **Participants** | Some stakeholders | All stakeholders | All stakeholders |
| **Rank update** | Not defined | Yes | Yes |
| **Tool support** | No | Yes | Yes |
| **Manual computations involved** | Yes | No | No |
| **Number of criteria for analysis** | Two criteria | Multi-criteria | *1st round:* Five criteria, and *2nd round:* Multi-criteria |


Q
A