

**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 improve 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



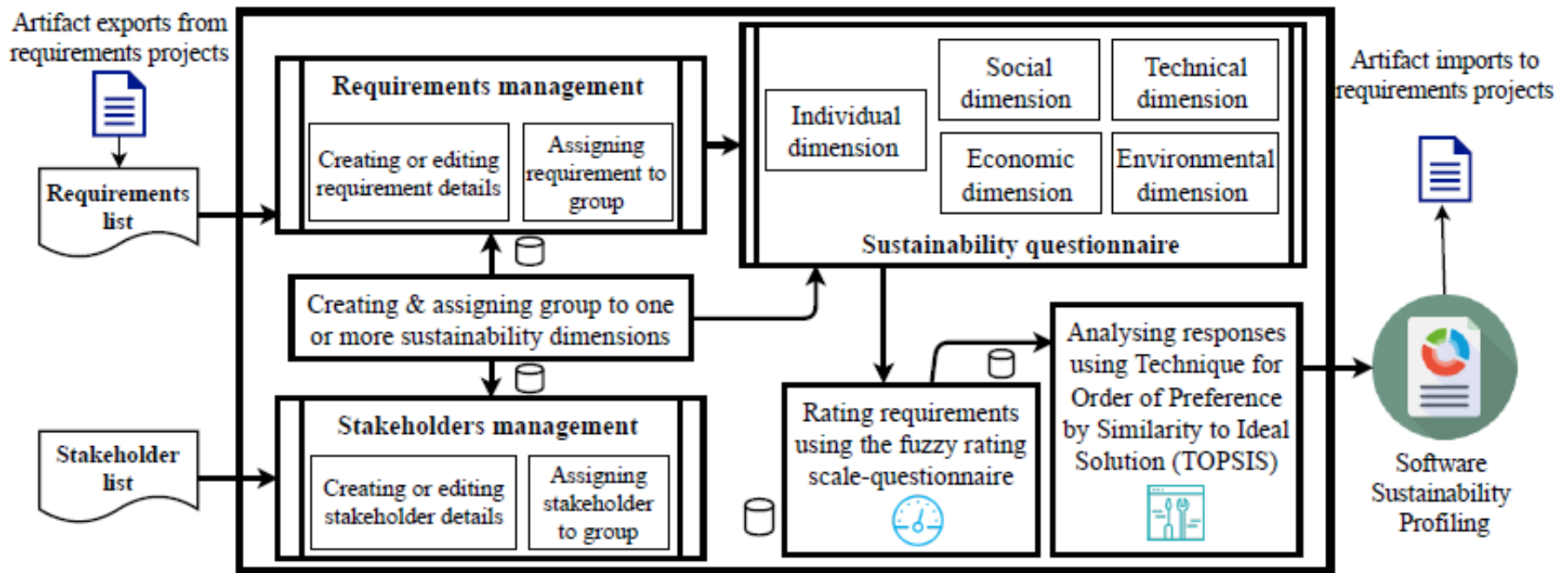
A positive economic value and capital growth should be ensured and maintained

## Environmental



Natural resources have to be protected from human needs and wastes

# SuSoftPro: Process Model



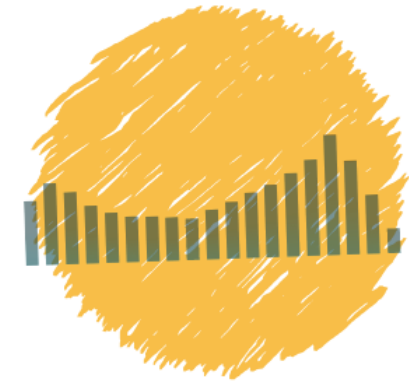
# SuSoftPro: Sustainability Profile



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)

The screenshot shows the SCIS patient portal. At the top, the URL is [www.scis.skincancerclinicofamerica.com/patient-s-file.html](http://www.scis.skincancerclinicofamerica.com/patient-s-file.html). The page features the "Skin Cancer Information System SOUTHERNSUN" logo and navigation links for Home, FAQ, Profile, and Sign Out. The user is identified as Joyce Zu, 27 years old. The interface includes tabs for Visit, General History, Pathology, and Recall / Review. The "Current Visit" section shows "No Record". The "All Visit" section lists several medical procedures with dates and statuses, such as "C21, Neck, Cryotherapy of skin cancer, Active, 2012-05-22". On the right, there are tabs for "Over All", "Clinical and Procedure", and "Pathology". The "Over All" tab is active, displaying a 3D human model with colored markers on the neck and chest areas.

The screenshot shows the "Clinical and Procedure" interface. It features a "New Procedure" section with a dropdown menu set to "Skin Biopsy". Below this is a 3D human model with a red marker on the chest. The "History" section includes fields for Duration (10:00), Dermoscopy (USED), and Clinical diagnosis (1. BCC, 2. IED/Bowens, 3. SCC, 4. Keratocanthoma). A "NOTE" field is also present. At the bottom, there are input fields for Body Part (Right\_Chest), Side (Front), and Size (Diameter, Directions, Height).



# 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	✓		✓	✓	✓

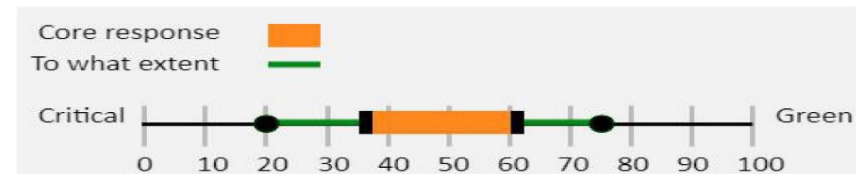
# Sustainability Profiling for SCIS (3)

## 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



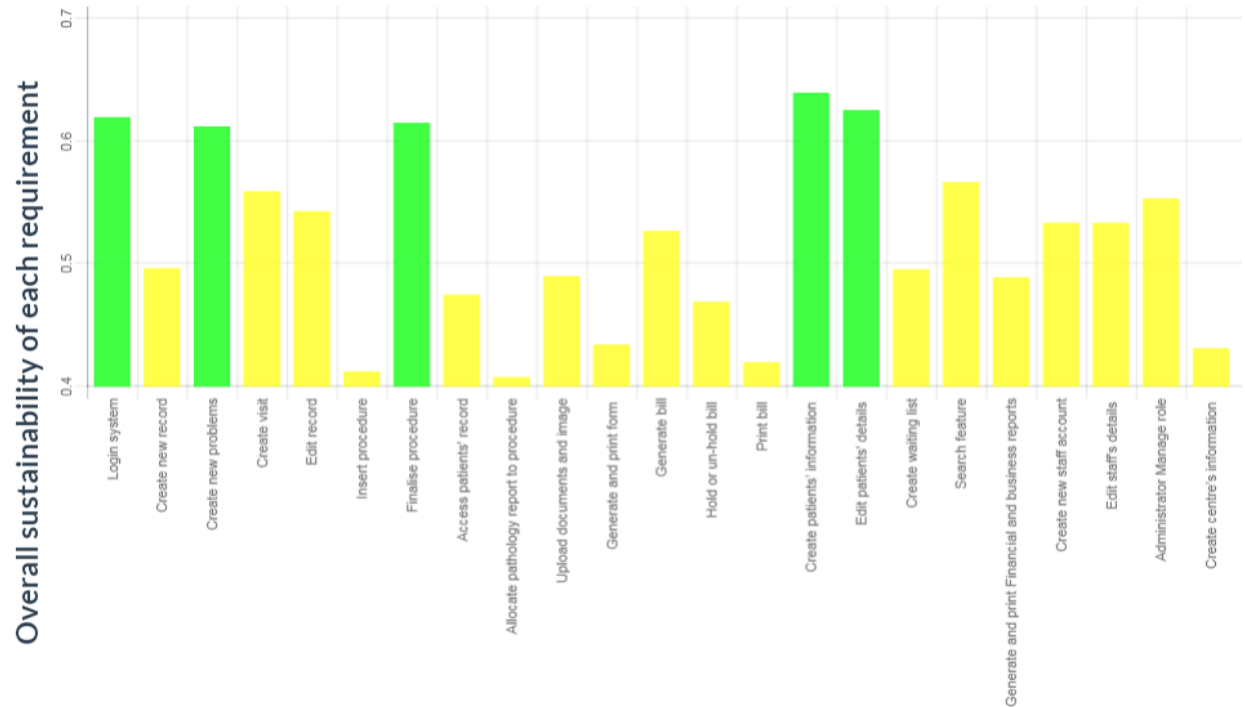


# Sustainability Profiling for SCIS (4)

## 7. Generating sustainability profiling



**Overall Sustainability**  
3 Stars ★★☆☆☆



# 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 "natural numbers" (several scales are used)	Online questionnaire "natural numbers" (scale from 1 to 5)	Online questionnaire "rational numbers" (fuzzy rating scale)
Weight scale	TOPSIS	WADM	TOPSIS
Analysis method	Some stakeholders	All stakeholders	All stakeholders
Participants	Not defined	Yes	Yes
Rank update	No	Yes	Yes
Tool support	Yes	No	No
Manual computations involved			<i>1st round: Five criteria, and 2nd round: Multi-criteria</i>
Number of criteria for analysis	Two criteria	Multi-criteria	

