

# Multi-Stakeholder Risk Assessment of Socio-Technical Systems Projects

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<https://rogerclarke.com/DV/MSRA-ACIS24.html>  
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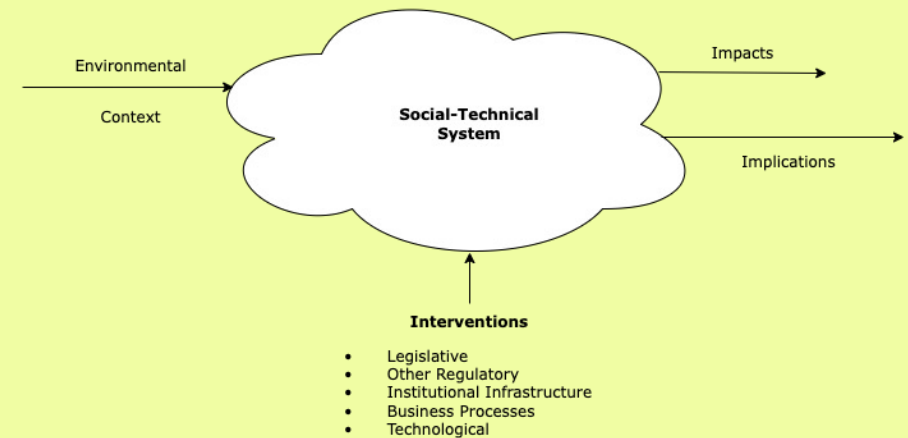
**ACIS'24 – Uni Canberra – 4 December 2024**

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# Large-Scale, Impactful Information Systems



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# Features of Contemporary IS

- Large Scale, Wide Reach, High Complexity
- Automated Inferencing, Decision, Action
- Obscurity and Unmaintainability
- Rapid Application Development (RAD/QAD). which short-changes QA in the desire for speed, and the (unfounded) hope for low overall cost
- Underinvestment in requirements gathering, which ensures poor fit to needs
- Project time and cost overruns, high error-content, collateral damage, functionality and RoI shortfalls
- Some projects fail completely

Dwivedi Y.K. et al. (2015) 'Research on information systems failures and successes: Status update and future directions'  
Information Systems Frontiers, 17,1 (2015) 143–157

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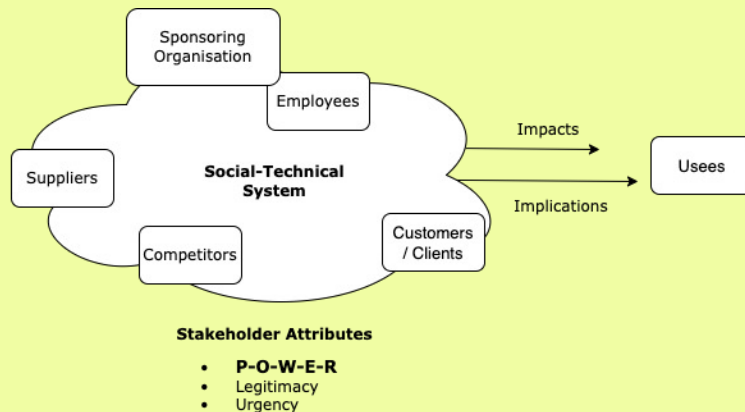
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## Stakeholders in a Social-Technical System



## Stakeholder Theory

- Created as a counterpoint to 'Shareholders'  
Applied across many management contexts, incl.:
  - **Users** of information systems
  - **'Usees'** of information systems  
Those impacted by it even though not participants in it
- Attributes of **Power, Legitimacy, Urgency**
- Sponsoring organisations consider only those Stakeholders capable of affecting project success
- **Legitimate-but-not-Powerful Stakeholders are not even seen as constraints let alone objectives**

## Researcher Perspective Theory

*A Researcher Perspective is a particular stakeholder perspective that is adopted by a researcher as **the, or a, viewpoint from which to observe phenomena during the conduct of a research project***

- 90% of IS Research is **Single-Perspective**
  - In 90% of that 90%, the System Sponsor is in focus
  - Users and Usees are seldom the focal point
- **Dual-Perspective** Research can reflect both System-Sponsor and User views, and inter-relate them, to the benefit of both
- **Multi-Perspective** Research is challenging, and uncommon

## The Purpose of this Project

Specify a practicable mechanism whereby  
the interests of Stakeholders  
can be reflected in IS project process

## Organisational Evaluation Techniques

- With a Focus on Quantitative Data:
  - Business Case Development (BCD)
  - Discounted Cash Flow Analysis (DCF)  
Net Present Value Analysis (NPV)
  - Financial Sensitivity Analysis
  - Financial Risk Assessment
- Plus Non-Quantifiable / 'Qualitative' Data:
  - Internal Cost-Benefit Analysis (CBA)
  - Risk Assessment (RA)

## Evaluation Techniques within a Broader Frame of Reference

- External Cost-Benefit Analysis (CBA)
- Technology Assessment (TA)
- Environmental Impact Assessment (EIA)
- Privacy Impact Assessment (PIA)
- Social Impact Assessment
- Child Rights Impact Assessment
- Surveillance Impact Assessment

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**Board directors of Sponsoring Organisations  
must serve the interests of shareholders**

## Risk Assessment: An Organisational Evaluation Tool

**based on  
The  
Conventional  
Security  
Model**

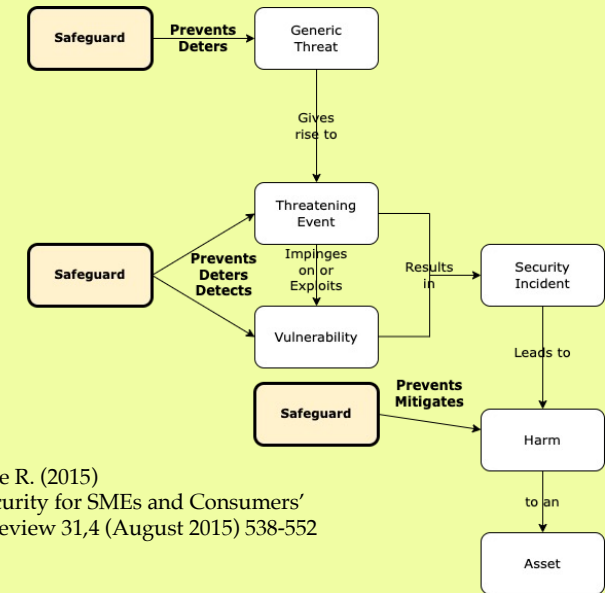


Clarke R. (2015)  
"The Prospects of Easier Security for SMEs and Consumers"  
Computer Law & Security Review 31,4 (August 2015) 538-552

## Categories of Threat

- **Environmental Events** (Acts of Gods or Nature)
- **Accidents**, caused by:
  - Humans who are directly involved
  - Other Humans
  - Artefacts and those Responsible for them
- **Attacks**, by:
  - Humans who are directly involved
  - Other Humans
  - Artefacts and Designers, Owners, Operators

## The Conventional Security Model + Safeguards



Clarke R. (2015)  
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## Risk

The perceived likelihood of occurrence of Harm arising to an Asset as a result of a Threatening Event impinging on a Vulnerability

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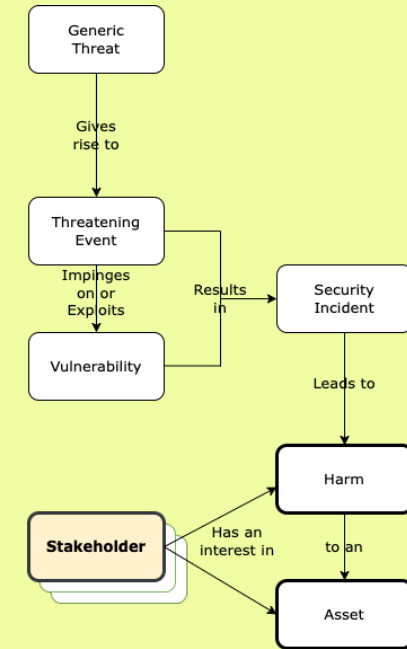
## The Focus of Risk Assessment: Residual Risk

The Risks that remain despite existing design features, safeguards, and mitigation measures

## Risk Assessment Process & Risk Management Process

1. **PERFORM RISK ASSESSMENT (The Analysis Phase)**
  - 1.1 Declare Objectives and Constraints
  - 1.2 Identify the Stakeholders
  - 1.3 Describe the Intended Intervention
  - 1.4 Adapt Objectives and Constraints
  - 1.5 Study Assets, Values, Harm
  - 1.6 Study Threats, Vulnerabilities
  - 1.7 Study Existing Safeguards
  - 1.8 Evaluate Residual Risks
  - 1.9 Summarise the Results
2. **PREPARE RISK MANAGEMENT (The Design Phase)**
  - 2.1 Consider Alternative Designs, Additional Safeguards and Mitigation Measures
  - 2.2 Evaluate against Objectives and Constraints
  - 2.3 Select / Adapt / Refine the Design
3. **PERFORM RISK MANAGEMENT (The Implementation Phase)**
  - 3.1 Plan the Implementation
  - 3.2 Execute the Implementation
  - 3.3 Review the Implementation

## The Conventional Security Model + Stakeholder



## The Purpose of this Project

Specify a practicable mechanism whereby the interests of Stakeholders can be reflected in IS project process

## Multi-Stakeholder Risk Assessment (MSRA)

Adapt conventional Risk Assessment & Management to enable the factoring in of the interests of other stakeholders

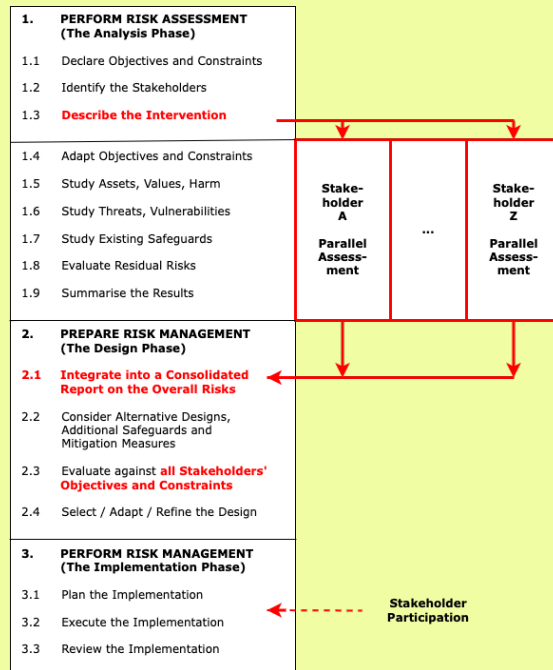
## Precursor The Responsible Application of AI

- Responsible application of AI is only possible if stakeholder analysis is undertaken, and insight is gained into their interests
- Risk Assessment processes that reflect the interests of stakeholders need to be broader than those commonly undertaken within organisations
- Responsible application of AI depends on Risk Assessments from the perspective of each stakeholder group complementing that undertaken from the organisation's perspective

Clarke R. (2019a) 'Principles and Business Processes for Responsible AI' Computer Law & Security Review 35,4 (2019) 410-422

Michael K., Abbas R. & Pitt J. (2021) 'Maintaining Control Over AI' Issues in Science and Technology 37,3 (Spring 2021)

## Multi-Stakeholder Risk Assessment & Risk Management Process



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## Important Features of MSRA

- **Identification of Stakeholders**, including:
  - External as well as internal parties
  - Both users and uses
- Inclusion on the basis of **Legitimacy, not just Power**
- **Engagement with Stakeholders** through:
  - Transparency
  - Facilitation of risk assessment by multiple stakeholders
  - Consideration of all stakeholders' risk assessments
- **Assimilation** of input by the sponsoring organisation
- **Evaluation** of alternative designs, additional safeguards and mitigation measures **informed by the consolidated appreciation of the risks**
- { Stakeholder Participation in implementation }

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## Illustration of MSRA Exemplars

- Small-Scale Environmental Impact Assessment
- Access to Mineral Ore-Bodies
- Closure of a Large Regional Facility
- Inherently Dangerous or Intrusive Interventions
- Overcoming Harmful Monopolies
- Creating an Open Marketspace
- Balancing Interests in a Networked Industry Sector
- The Platform-Based Business Sector

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## Illustration of MSRA A Case Study: Robodebt

- Context
- Narrative
- Outcomes
- What-If MSRA had been applied?
  1. Reactive Approach
  2. Contingency Planning Approach
  3. Proactive Approach
  4. Strategic Approach

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## Robodebt – Context – as at 2015

- Welfare-benefits administration agency  
DHS / Services Australia / Centrelink
- Very large and very experienced in IT
- Focus on fraud / error / waste management
- Fortnightly statements of income by clients
- Data-matching against taxation authority data
- The hype about 'transformative IT'

**Services Australia**

We deliver government payments and services



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## Robodebt – Narrative – 2015-2023

- Tax data 'averaged' to fortnights
- **Material differences assumed to be evidence of overpayment**
- Automated letters of demand sent to clients
- Onus of proof placed on clients
- Demand for specific evidence about earnings in periods between 2 and 7 years previously
- In the absence of a response, or of evidence, debt raised and debt collection undertaken

Clarke R., Michael K. & Abbas R. (2024) 'Robodebt: A Socio-Technical Case Study of Public Sector Information Systems Failure' Australasian J. of Infor. Syst. 28 (September 2024) 1-42, at <https://journal.acs.org.au/index.php/ajis/article/view/4681/148>

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## Robodebt – Outcomes

- In 2016-19, > 1 million letters sent to clients
- 433,000 clients issued with debt notices - \$1.7bn
- 381,000 pursued and \$750m collected
- No evidence available to clients or advocates
- **Untenability clear to the public in Dec 2016**
- **Continued until Nov 2019**
- Very harmful to users, and to usees
- The agency delayed court-cases until 2019-20
- **Comprehensive defeat in the courts, and all actions were quashed**
- **Unwinding not completed until 2023-24**

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## MSRA 1. – The Reactive Approach

- Do nothing in advance
- **If and only when needed**, move fast, using a cut-down version of MSRA
- **Brief the media**
- **Implement a 'charm offensive' with advocates:**
  - 'Summit' meetings
  - Promises of:
    - Design changes
    - Mitigation measures

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## MSRA 2. – The Contingency-Planning Approach

- Avoid 'the barbarian inside the gates', and disclosure of sensitive information
- **Use a proxy to provide insights into stakeholders i.e. consultants or staff-members**
- **Guess the key issues** for powerful stakeholders, and **pre-plan for contingencies**, especially:
  - Media releases
  - Design changes
  - Mitigation measures

## MSRA 3. – The Proactive Approach

- **Apply MSRA in advance** (or even in parallel)
- Identify relevant (suitable) **stakeholder reps**
- **Engage them, inform them** (enough)
- **Listen, assimilate their messages** (or be seen to)
- **Reflect advocates' input** in:
  - Design features (choose harmless\* ones)
  - Mitigation measures (ditto)

\* Harmless to the sponsoring organisation, not necessarily valueless to stakeholders

## MSRA 4. – The Strategic Approach

- **Use a 'Reference Group'** to:
  - Internalise appreciation of stakeholders' perspectives
  - Institutionalise channels of communication
- **Seed Conversations** by disclosure and briefings
- **Financially support** participation
- **Achieve Distant Early Warning** of:
  - Design issues
  - The scope for collateral damage
  - Possible mitigation measuresby means of:
  - Authentic anecdotes / segments / special cases

## Robodebt – Categories of 'Uses'

- Dependents of social welfare clients
- Householders of social welfare clients
- Carers
- Mothers
- Counsellors
- Lawyers
- ...



## Categories of Advocacy Organisations in the Social Welfare Sector

- **Social Welfare Peak Body/ies**
- **Social Welfare Specialised NGOs**  
Clients disadvantaged economically, physically, mentally  
Clients in ethnic communities, low literacy groups
- **Population Segments**  
Single parents, Tertiary students, Younger workers, Older workers, Indigenous people, Old-age, Disability pensioners
- **Consumer and Privacy Advocacy Organisations**
- **Service Providers**  
Community legal centres, Legal aid offices
- **Professional Associations**  
Social workers, Financial counsellors, Lawyers
- **Unions**  
Public servants, Seasonal workers, Unemployed workers

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## Conclusions – 1 of 2

- Interventions have impacts now, and implications later
- **Impactful interventions need evaluation not just deployment**
- Organisational techniques support System Sponsors  
(Business Case Development is driven by prospects of profit)
- **There are few drivers for multi-stakeholder assessment**  
Exception: Stakeholders recognised as having enough power  
(Legitimacy and Urgency are irrelevant to System Sponsors)
- **Often, harm to stakeholders can be avoided or mitigated with limited compromise to the sponsor's objectives**
- Impact Assessment variants are narrow (a category of impacts)
- Technology Assmt is broad (a technology, applied to anything)

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## Conclusions – 2 of 2

- **Risk Assessment** comes from rational enterprise management and **is familiar** in many organisations
- It is **theoretically capable of adaptation** to deliver the System Sponsor insights into the concerns of Stakeholders
- **Exemplars exist** of some MSRA features
- Mapping it into a large-scale failure case suggests that **all parties could have gained from any use of MSRA**
- At worst, MSRA informs and warns System Sponsors
- At best, MSRA results in:
  - more enlightened System Sponsor understanding
  - less harmful designs
  - compensatory mitigation measures

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