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BRIGHT FUTURES



Ethics In Technology

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In collaboration with IEEE Italy Section

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Chair & Technical Editor, IEEE P7000 Standard



Ethics, Principles & Practice

A Short Overview and Awareness Raising Workshop

Disclaimer: This presentation solely represents the views of Ali Hessami and does not necessarily represent a position of either the IEEE or the IEEE Standards Association.

Overview of the Talk

- Definitions and Clarifications
- Principal Ethical Paradigms
- Emerging Guidance & Standards
- Support Resources & References



Definitions I

➤ Ethics

A branch of knowledge that deals with moral principles (that govern a person's behaviour)

➤ Morals

Considerations of right & wrong behaviour (acceptable in a particular society/culture)



Definitions II

Principle :

- ➔ Fundamental Truth or proposition on which many others depend
- ➔ A Fundamental Assumption forming the basis of a chain of reasoning



Ethical Principles in Eng.

- Royal Academy and Engineering Council-UK
 - Honesty & Integrity
 - Respect for Life, Law, Environment and Public Good
 - Accuracy and Rigor
 - Leadership & Communication



Ethical Principles in Eng.-I

➤ Honesty & Integrity

- act in a reliable and trustworthy manner
- be alert to the ways in which their work and behaviour might affect others and respect the privacy, rights and reputations of other parties and individuals
- respect confidentiality
- declare conflicts of interest
- avoid deception and take steps to prevent or report corrupt practices or professional misconduct
- reject bribery and improper influence



Ethical Principles in Eng.-II

➤ Respect for Life, Law, the Env. & Public Good

- hold paramount the health and safety of others and draw attention to hazards
- ensure their work is lawful and justified
- recognise the importance of physical and cyber security and data protection
- respect and protect personal information and intellectual property
- protect, and where possible improve, the quality of built and natural environments
- maximise the public good and minimise both actual and potential adverse effects for their own and succeeding generations
- take due account of the limited availability of natural resources
- uphold the reputation and standing of the profession



Ethical Principles in Eng.-III

➤ Accuracy & Rigor

- always act with care
- perform services only in areas in which they are currently competent or under competent supervision
- keep their knowledge and skills up to date
- assist the development of engineering knowledge and skills in others
- present and review theory, evidence and interpretation honestly, accurately, objectively and without bias, while respecting reasoned alternative views
- identify, evaluate, quantify, mitigate and manage risks
- not knowingly mislead or allow others to be misled



Ethical Principles in Eng.-IV

➤ Leadership & Communications

- be aware of the issues that engineering and technology raise for society, and listen to the aspirations and concerns of others
- promote equality, diversity and inclusion
- promote public awareness and understanding of the impact and benefits of engineering achievements
- be objective and truthful in any statement made in their professional capacity
- challenge statements or policies that cause them professional concern



10 Moral Values

Wisdom

I think through my decisions carefully.

Fairness

I treat others fairly and with respect.

Courage

I stand up for my beliefs and do what's right.

Self Control

I am patient and self-disciplined.

Trust

I am trustworthy, reliable and also trusting of others.

Hope

I encourage others to be positive.

Humility

I am less important than the team.

Love

I am empathic and care about other people.

Honesty

I speak the truth and encourage others to be open.

Excellence

I try to do my best in everything I do.

Principal Ethics Theories

- **Consequentialism/Utilitarianism (JS Mill)**
 - Deals with Happiness & Well being
 - Everyone ought to act to bring greatest happiness for greatest No. of People
- **Deontological/Duty (E Kant-Categorical Imperative)**
 - put yourself as a universal law maker and whether the object will influence people, destroy, threaten or create values?
 - Also WD Ross on prima facie duties covering Fidelity, Reparation, Gratitude, Promoting Max Good & non-Maleficence
 - Top Management's Personal Ethics impacting on decisions to align with stakeholders expectations
- **Virtue Ethics (Aristotle)**
 - What stakeholders are affected? Virtues are character qualities borne by persons
 - How is virtuous behavior impacted?
 - Vice is opposite to virtue but core principle is to "be good" hence Virtue



Challenges - I

- Three approaches generate KPIs for ethical behaviour
- There's a need for appropriate level of Stakeholder involvement
 - Habermas Critical Theory and Guidelines
- Avoiding imposition of one view as Normative Ethics
- Most Ethical Concerns are not Necessarily Legal Concerns
- Need to address Life Cycle:
 - Project Initiation & Planning
 - System Analysis
 - System Design
 - System Development,
 - Deployment & Maintenance
- Need to Identify key Processes
 - Processes have Name, Purpose and Outcomes achieved through Activities & Tasks
- Regulators do not have a common language or starting point



Challenges - II

- Identifying the right values in a SOI context of application:
 - Stakeholder Identification; Context, Value Discovery, Value Verification, Value Conceptualisation, Value Measure -> Value Based System Requirements
- Ensuring different Cultures & Customary Laws are respected re ethinc, cultural & linguistic sensitivities
- Addressing Value Conflicts e.g. Privacy vs Security
- Defining the Key Roles and Competences?
- Seeking empirical evidence of Values at Stake?
- What is Expected from Public/Private Corporates?
- Need for Ethical Terms
 - (World Value Survey, World Happiness, Frankena List, Friedman/Kahn List, ...)



IEEE P7000- Standard

Model Process for Addressing Ethical Concerns During System Design

➤ Purpose

- help to create a shared mission around values, value priorities and value harms to avoid and
- help to assure value based system engineering, by building a bridge between the value mission and the actual development of a system.



Draft IEEE P7000 - Process

➤ Ethical Mission Analysis

- Define System of Interest and Context of Use
- Collect unstructured Ideas as Harms & Benefits and weight these
- Use Life Cycle as per ISO/IEC TR24748-1:2010, ISO/IEC/IEE 15288

➤ Value Needs Refinement

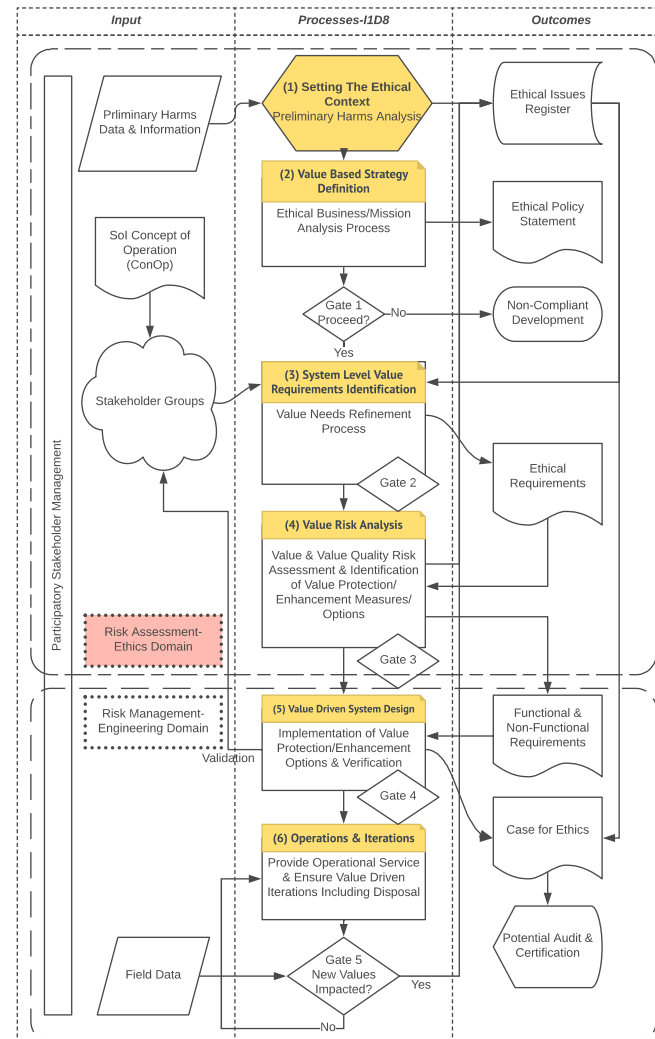
- Identify Harms and Benefits' Underlying Values
- Conceptually Investigate Value Qualities

➤ Value Risk Management

- Treat Value Qualities as System Qualities at Risk
- Analyse, Evaluate and Treat Risks
- Identify and select System Controls for all System Qualities at Risk



Ethical Process Reference Model



P7000 WG Structure

Chair & VC

Technical Editor

Secretary

Sub-Groups; Ethics, Process, Risk, SoS & Ontology

56+ WG members

IEEE P7000 – Current Status

- Baseline delivered Oct. 2017
- Technical Editor Appointed Dec. 2017
- Sub Groups work initiated early 2018
- New Chair Appointed Aug. 2018
- A New WG draft is being Prepared by TE expected Oct. 2018
- An Issue is expected in Q1 in 2019



P7000 Suite

[P7000 - Model Process for Addressing Ethical Concerns During System Design](#)

[P7001 - Transparency of Autonomous Systems](#)

[P7002 - Data Privacy Process](#)

[P7003 - Algorithmic Bias Considerations](#)

[P7004 - Standard for Child and Student Data Governance](#)

[P7005 - Standard for Transparent Employer Data Governance](#)

[P7006 - Standard for Personal Data Artificial Intelligence \(AI\) Agent](#)

[P7007 - Ontological Standard for Ethically Driven Robotics and Automation Systems](#)

[P7008 - Standard for Ethically Driven Nudging for Robotic, Intelligent and Autonomous Systems](#)

[P7009 - Standard for Fail-Safe Design of Autonomous and Semi-Autonomous Systems](#)

[P7010 - Wellbeing Metrics Standard for Ethical Artificial Intelligence and Autonomous Systems](#)

[P7011 - Standard for the Process of Identifying and Rating the Trustworthiness of News Sources](#)

[P7012 - Standard for Machine Readable Personal Privacy Terms](#)

[P7013 - Inclusion and Application Standards for Automated Facial Analysis Technology](#)

<https://standards.ieee.org/>



Ethics of Autonomous Systems

- **controlled systems:**
 - where humans have full or partial control, such as an ordinary car
- **supervised systems:**
 - which do what an operator has instructed, such as a programmed lathe or other industrial machinery
- **automatic systems:**
 - that carry out fixed functions without the intervention of an operator, such as an elevator
- **autonomous systems:**
 - that are adaptive, learn and can make 'decisions'



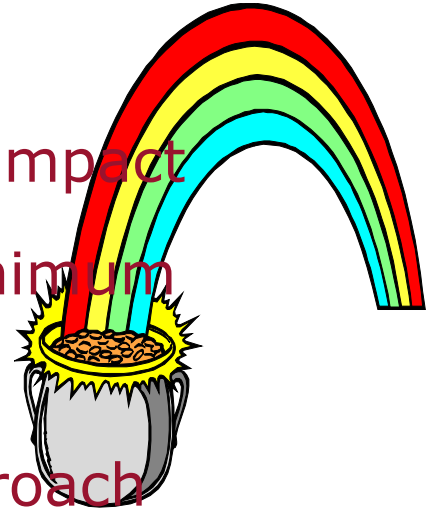
Ethical Issues in Smart Systems

- Smart systems are close to the horizon and could be of significant benefit.
- They are being developed largely without ethical research.
- There is a danger of bad design, with assumptions about users and their behaviour embedded in programming.
- It is important that ethical issues are not left for programmers to decide – either implicitly or explicitly.



Way Forward

- Humanity's destiny is increasingly intertwined
- Aim for public good should sit alongside/
transcend commercial gains
- Ethical Approach will have bottom line impact
- Need to go beyond conformity with minimum
(Legal) Requirements
- Need A Holistic Auditable Systems Approach



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