

Contents

<i>Foreword</i>	v
<i>Preface</i>	vii
<i>Acknowledgments</i>	ix
Chapter 1 Philosophy of Idea Engineering	1–16
Introduction	2
From Engineer to Problem Thinker	2
Why Idea Engineering Matters Today	4
The 3Ps Framework of Idea Engineering	5
Idea Engineering versus Traditional Engineering	12
The Innovation Mindset	13
Chapter 2 Anatomy of a Knowledge Constructor	17–36
Introduction	17
Building a Specialised Intelligence Base	18
Computational Thinking	20
Information Synthesis	24
Algorithmic Literacy	26
Ethics of Innovation	30
The Wikipedia Model	33
Chapter 3 Art of Empathetic Observation	37–55
Introduction	37
Emotional Impact Assessment	38
Affective Mapping Technique	40
Root Cause Empathy	42
Societal Toll of Unaddressed Problems	44
Participatory Observation Protocols	45
Identifying Community Gatekeepers	45
Co-Creation Workshops	46
Scouts for Sustainable Development Goals: The Scout Method in Design	48
Mapping Local Realities to Global Goals	50
Ethnographic Deep-Diving	51
Artefact Analysis	52
Ethical Safeguards in Observation	53

Chapter 4	Localising Global Challenges through Sustainable Development Goals	56–77
	Introduction	57
	Systems Thinking in Localised Problem-Solving	58
	Sustainable Development Goal Alignment	59
	Contextual Mapping	66
	Learning Beyond the Classroom	69
	Technology for Social Good	73
	Barriers to Sustainable Innovation	74
	Engineers as Change Makers	75
Chapter 5	Engagement in Rural Development	78–100
	Introduction	78
	Gram Panchayat—Foundation of Rural Governance	79
	Rural Technology and Appropriate Technology	82
	Government Schemes and Community Development	83
	Social Innovation and Frugal Innovation	93
	All India Council for Technical Education Internship Policy—Engineers and Society.....	94
	Unnat Bharat Abhiyan 2.0	95
Chapter 6	Problem Identification and Market Gaps	101–120
	Introduction	101
	Identifying Root Causes from Symptoms	102
	Understanding User Needs and Pain Points through Observation and Research	104
	Measuring the Impact of Problems on Individuals, Society, and Industries	106
	Performing Gap Analysis to Identify Unmet Market Needs	110
	Converting User Pain Points into Clear and Actionable Problem Statements	113
	Prioritising Problems Based on Feasibility, Impact, and Innovation Potential	118
Chapter 7	Techniques for Rapid Ideation	121–141
	Introduction	122
	Understanding Rapid Ideation	122
	Creative Thinking	123
	The Ideathon Workflow	124
	Creative Techniques and Idea Selection	125
	Identification of Primary, Secondary, and Tertiary Sustainable Development Goals	129
	Working Effectively in Multidisciplinary Teams to Enhance Creativity	136
	Refining Ideas through Expert Feedback and Institutional Support	137
	Developing Innovative Concepts into Feasible Products or Solutions	138
	AI-Assisted Ideation: Ethical Boundaries and Human Oversight	139
	Visualising the Solution	140

Chapter 8 Visualising the Unseen	142–163
Introduction	142
Designing a Smart Water Bottle	143
Ideation	143
Importance of Drawing in Innovation	145
Drawing as a Universal Communication Tool	145
Visual Thinking	146
Freehand Sketching Basics	148
Drawing Everyday Objects	151
Focus Areas	152
Characteristics of a Good Annotated Sketch	155
Storyboard Sketching	157
Drawing for Sustainable Innovation	160
Chapter 9 Value Proposition Fit	164–183
Introduction	164
Understanding the Value Proposition	165
Identifying Customer Needs and Pain Points	170
Developing Value-Driven Solutions	174
Defining Product and Service Scope	176
Creating Unique and Personalised Solutions	178
Evaluating Product–Market Fit	181
Customer Relationship Management	181
Chapter 10 Case Studies in Successful Idea Generation	184–201
Introduction	185
Case Study 1: Zipline—Drone Medical Delivery	185
Case Study 2: Gravitylight—Generating Light Using the Force of Gravity	187
Case Study 3: Safepad—Affordable Reusable Sanitary Pads for Menstrual Hygiene	189
Case Study 4: Vermicompost Enterprise Development—Transforming Organic Waste into Sustainable Business Opportunities	191
Case Study 5: Transforming Rural Agriculture through Collective Innovation	194
Case Study 6: AGSAIMO—Transforming Floral Waste into Sustainable Agarbathi Sticks ..	196
Activity	198
Chapter 11 Protecting and Funding the Idea	202–227
Introduction	202
Startup	203
Why Startup Idea Protection is Important	205
Intellectual Property Rights	206

Funding the Startup Idea	212
Funding Opportunities for Student Startups at Sri Sairam Perspective	219

Chapter 12 Future of Idea Engineering 228–246

Introduction	228
The Changing Landscape of Idea Engineering	229
Future Competencies for Idea Engineers	231
Skills for Life: The Foundation of Future Innovation	238
Healing the Planet through Innovation	240
Future Innovation Ecosystems: Collaborating to Solve Tomorrow's Challenges	240
Understanding Customers in Idea Engineering	242
Sairam Innovation Ecosystem: From Ideas to Impact	244
Legacy Thinking: Designing Beyond Your Lifetime	246