Mahatma Gandhi Vidyamandir's

PANCHAVATI COLLEGE OF MANAGEMENT AND COMPUTER SCIENCE, NASHIK

Affiliated to Savitribai Phule Pune University, Pune.

SPPU ID: PU/NS/CS/65/2001

Mumbai – Agra Road, (NH-03), Panchavati, Nashik-422003. (Maha.) INDIA

Off.: 91-253-2628273/74

Resi.: 91-253-2360678

Email: pcmcs_bcs@rediffmail.com

Mahatma Gandhi Vidyamandir's

Panchavati College of Management and Computer Science- Nashik-03

Affiliated to Savitribai Phule Pune University, Pune.

SPPU ID: PU/NS/CS/65/2001

Mumbai – Agra Road, (NH-03), Panchavati, Nashik-422003. (Maha.) INDIA

Off.: 91-253-2628273/74 Resi.: 91-253-2360678 Email: pcmcs_bcs@rediffmail.com

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

DVV Clarification

3.3.2

Provide cover page,content page and first page of the selected publication.Provide weblink of book for the year2019-20,2020-21.

Response: As per suggestions by the NAAC, we are here with providing following documents,

-Yearwise list of books and chapters in edited volumns/books published

-publication cover page,content page and first page

-link of the book available in amazon website.

3.3.2 Number of books and chapters in edited volumes/books published and paperspublished in national/ international conference proceedings per teacher during last five years

Sr. No.	Year	Name of the teacher	Title of the book/chapters published	Page No	Web Link
1	2019-20	Mr. Deepak S. Dandwate	Object Oriented Software Engineering	5	https://www.tppl.org.in/2020/fifth-semester/5602-object-oriented-software-engineering.html
2	2020-21	Mr. Deepak S. Dandwate	E-Waste management and procurement of Environment	13	https://www.amazon.in/Waste-Management-Procurement-Environment/dp/B095PR6MVS
3	2020-21	Dr. Umesh J. Tupe	E-Waste management and procurement of Environment	13	https://www.amazon.in/Waste-Management-Procurement-Environment/dp/B095PR6MVS
4	2020-21	Mr. Deepak S. Dandwate	Project Management	26	https://www.tppl.org.in/2020/third-sem/4937-project-management-book-for-mba-3rd-semester-sppu.html
5	2020-21	Dr. Umesh J. Tupe	Physics for CSIR-NET/SET	35	https://www.researchgate.net/profile/Anil-Gite-2/publication/330839550_CSIR-NET_SET_Theory_and_MCQ's/links/5c66702c92851c48a9d4e75d/CSIR-NET-SET-Theory-and-MCQs.pdf

IQAC Co-Ordinator
MGV Panchavati College of Management and Computer Science, Panchavati Nashik-3

Panchavati College of Mgt. Comp. Science Panchavati, Nasik-3

Acting Principal
Panchavati College of Mgt. & Computer Science, Panchavati, Nasik-3.

Mahatma Gandhi Vidyamandir's

Panchavati College of Management and Computer Science- Nashik-03

Affiliated to Savitribai Phule Pune University, Pune.

SPPU ID: PU/NS/CS/65/2001

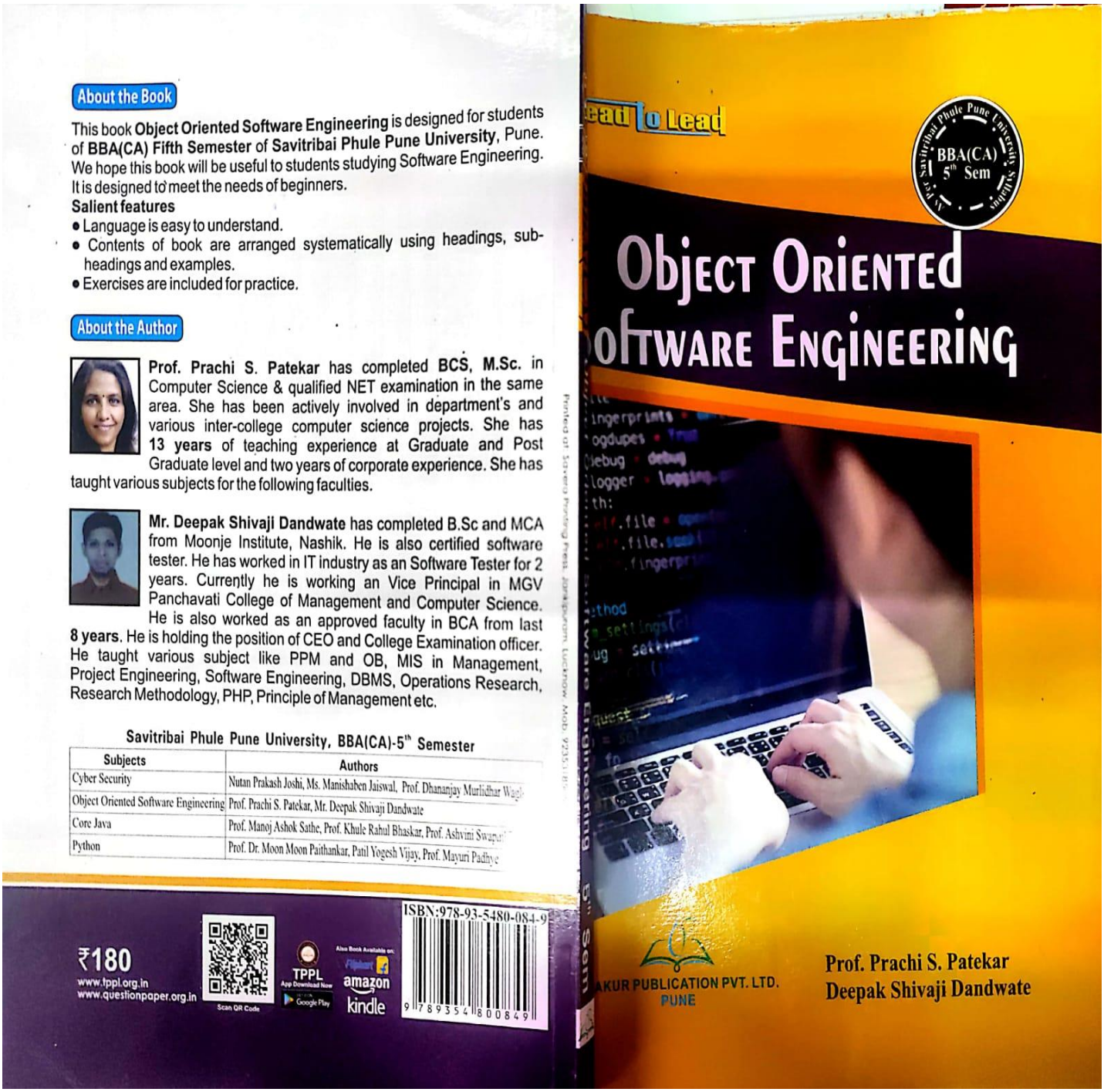
Mumbai – Agra Road, (NH-03), Panchavati, Nashik-422003. (Maha.) INDIA

Off.: 91-253-2628273/74 **Resi.: 91-253-2360678** **Email: pcmcs_bcs@rediffmail.com**

2019-2020

1)Object-Oriented Software Engineering :

Cover Page



About the Book

This book **Object Oriented Software Engineering** is designed for students of **BBA(CA) Fifth Semester** of **Savitribai Phule Pune University**, Pune. We hope this book will be useful to students studying Software Engineering. It is designed to meet the needs of beginners.

Salient features

- Language is easy to understand.
- Contents of book are arranged systematically using headings, sub-headings and examples.
- Exercises are included for practice.

About the Author

Prof. Prachi S. Patekar has completed **BCS, M.Sc.** in Computer Science & qualified NET examination in the same area. She has been actively involved in department's and various inter-college computer science projects. She has **13 years** of teaching experience at Graduate and Post Graduate level and two years of corporate experience. She has taught various subjects for the following faculties.

Mr. Deepak Shivaji Dandwate has completed B.Sc and MCA from Moonje Institute, Nashik. He is also certified software tester. He has worked in IT industry as an Software Tester for 2 years. Currently he is working an Vice Principal in MGV Panchavati College of Management and Computer Science. He is also worked as an approved faculty in BCA from last **8 years**. He is holding the position of CEO and College Examination officer. He taught various subject like PPM and OB, MIS in Management, Project Engineering, Software Engineering, DBMS, Operations Research, Research Methodology, PHP, Principle of Management etc.

Savitribai Phule Pune University, BBA(CA)-5th Semester

Subjects	Authors
Cyber Security	Nutan Prakash Joshi, Ms. Manishaben Jaiswal, Prof. Dhananjay Murlidhar Wagh
Object Oriented Software Engineering	Prof. Prachi S. Patekar, Mr. Deepak Shivaji Dandwate
Core Java	Prof. Manoj Ashok Sathe, Prof. Khule Rahul Bhaskar, Prof. Ashvini Swapnil
Python	Prof. Dr. Moon Moon Paithankar, Patil Yogesh Vijay, Prof. Mayuri Padhye

Printed at Saraswati Printing Press, Aliganj, Lucknow, Mob. 9235118...

₹180
www.tppl.org.in
www.questionpaper.org.in
Scan QR Code
TPPL App Download Now
Google Play
Also Book Available on: Flipkart amazon kindle

ISBN:978-93-5480-084-9
9 789354 800849

Lead to Lead

Savitribai Phule Pune University BBA(CA) 5th Sem

Object Oriented Software Engineering

TAKUR PUBLICATION PVT. LTD.
PUNE

Prof. Prachi S. Patekar
Deepak Shivaji Dandwate

First Page

OBJECT ORIENTED SOFTWARE ENGINEERING

BBA (CA), FIFTH SEMESTER

According to the New Syllabus of **'Savitribai Phule Pune University', Pune**

Prof. Prachi S. Patekar
M.Sc (Comp. Sci.), NET, B.C.S, C-DAC
Assistant Professor
Nowrosjee Wadia College, Pune

Deepak Shivaji Dandwate
MCA, B.Sc.
Assistant Professor,
MGV Panchvati College of Management
and Computer Science, Nashik

THAKUR PUBLICATION PVT. LTD., PUNE

* Ahmedabad * Bengaluru * Bhopal * Bhubaneswar * Chennai * Dehradun * Ernakulam * * Hyderabad * Jaipur * Jalandhar * Kolkata * Lucknow * Nagpur * Patna * Raipur * Ranchi * Rohtak *

Object Oriented Software Engineering

- *Prof. Prachi S. Patekar*
- *Deepak Shivaji Dandwate*

Published by:
Thakur Publication Pvt. Ltd.
HO: Abhishekpuram, 60 Feet Road, Jankipuram, Lucknow-226021
Mobile: 9235318594/22/17, 9335318517

Branch Office:
Colony No.14, Ganesh Nagar Bhopkhel, Near Ganesh Temple, PO-CME, Pune-411031
Mob.: 9325036341, 9326863355, 9373086387

Website: www.tppl.org.in
Email: thakurpublication@gmail.com

Books are Available for Online Purchase at: **tppl.org.in**
Download old Question papers from: **www.questionpaper.org.in**

ISBN No. 978-93-5480-084-9
First Edition 2022

Printed at:
Savera Printing Press
Tirupatipuram, Jankipuram Extension-226 031
Near Abdul Kalam Technical University, Lucknow
E-mail: lkospp@gmail.com, Mobile No. 9235318506/07

Acknowledgement

First and foremost, praise and thanks to **'God'**, the **Almighty**, for his showers of blessings throughout my research work enabling me to complete the research successfully.

I express my deep sense of gratitude to the **Thakur Publication Pvt. Ltd.** for giving me an opportunity to write a book that led me through the ladder of success.

I also thank Principal, **Dr. Venkatraghavan, Vice Principal, Dr. Bahule**, Head of the Department **Prof. C. S. Nimkar** and other **colleagues** in the department for their encouragement and support.

I am greatly indebted to my **Parents** and **Family** for their endless support in completing the assignment.

- Prof. Prachi S. Patekar

First and foremost, I express my sincere gratitude to the **'Almighty'**, for having given me an opportunity and strength to write this book.

I would to thank My **Family Members**, for their support to work and bringing the book to the day light.

I sincerely thank My **Teachers,** who showed me the right path in my career which enabled me to bring out this book.

I owe a deep sense of obligation to my academic **Colleagues** and **Students**, for their whole hearted co-operation and support.

I am indebted to the **Thakur Publication Pvt. Ltd.**, and their entire team for the efforts they have put in for making this book a reality and helping in the neat execution of the text.

- Deepak Shivaji Dandwate

Content Page :

Contents

Unit 1: Introduction and Basics of Software Modellin

Unit 2: SRS Documentation

Unit 3: Unified Modeling Language

Unit 4: Object Oriented Concepts and Principles

Unit 5: Structural Modeling

Unit 6: Basic Behavioural Modeling

Unit 7: Architectural Modelling

Unit 8: Object Oriented Analysis

E-waste

Unit 9: Object Oriented Design

IQAC Co-Ordinator
MGV Panchavati College of Management
and Computer Science, Panchavati,Nashik-3

Panchavati College of Mgt. Comp. Science Panchavati, Nasik-3

Acting Principal
Panchavati College of Mgt.
& Computer Science,
Panchavati, Nasik-3.

Mahatma Gandhi Vidyamandir's

Panchavati College of Management and Computer Science- Nashik-03

Affiliated to Savitribai Phule Pune University, Pune.

SPPU ID: PU/NS/CS/65/2001

Mumbai – Agra Road, (NH-03), Panchavati, Nashik-422003. (Maha.) INDIA

Off.: 91-253-2628273/74 Resi.: 91-253-2360678 Email: pcmcs_bcs@rediffmail.com

2020-2021

E-Waste management and procurement of Environment:

Cover Pages:

Contemporary world can't ignore waste though it is far from being a glamorous subject. Current life style and consumption pattern of every individual generates tons of waste over one's lifetime in which waste electrical and electronic equipment, *i.e.*, electronic waste (e-waste) is the fastest growing solid waste because of its high obsolescence rate. Presence of hazardous elements and precious metals in e-waste becomes a prominent source of environmental problems as well as opportunities. Globally, the current quantity of e-waste generated grew up to approximately 56.3 million tons which is equivalent to 7.3 kg per capita. Annually the rate of increase of e-waste generation is 3% - 5% globally. The rate of e-waste production gives a direct threat resulting in huge loss of rare earth metals/natural resources. An interesting fact is that around 320 tons of gold (Au) and 7,500 tons of silver (Ag) are used annually for making personal computers, mobiles, tablets and other electronic goods and a worth of $21 billion of precious metals is eventually available through e-waste. It provides material for remanufacture, refurbishment as well as recycling. The environmental toxicants commonly found in e-waste include toxic metals and metalloids such as arsenic, barium, beryllium, cadmium, cobalt, chromium, lead, mercury, etc., and persistent organic pollutants such as dioxin, BFRs, PAHs, PCBs, PBDD/Fs, PCDD/Fs, PVC, and AHFRs. Such a variety of toxicants could cause environmental problems and harm human health unless appropriate management procedure is applied. The hazards of e-waste contamination to the surrounding environment including soil, sediment, water, and air has become a serious issue in many developing countries. In case of humans, exposure to toxic substances through inhalation, ingestion and dermal contact can harm the human health in both chronic and acute conditions. The resources in e-waste are normally recycled by both formal and informal procedures. Manual e-waste recycling inescapably leads to the release of toxins and persistent organic pollutants into the environment in addition to harming the health of the recycling person due to the primitive techniques used. Many countries have framed rules and guidelines to manage e-waste for producers, consumers and recyclers. This book will provide an overview of globally e-waste management and current trends in research to mitigate the environmental problems as well as the potential of circular economy.

The main objective of this scholarly anthology is to encourage genuine research papers providing evocative insight into the considerable content in global context and to facilitate dissemination of knowledge among academicians and researchers worldwide.

THEMES/SUB-THEMES:

1. Global E-waste key statistics with forecasts
2. E-waste management: current best practices across the globe
3. E-waste impact on health and environment
4. E-waste policies/legislation
5. Advancements in recycling of E-waste
6. Challenges and opportunities in E-waste management
7. Extended producer responsibility and E-waste minimization
8. Strategies for future E-waste management in smart cities
9. The potential of E-waste in a circular economy

ISBN 978-93-90588-87-9

AUTHORS PRESS

Publishers of Creative & Scholarly Books

9 789390 588879

₹ 995 | $ 40

IQAC Co-Ordinator
MGV Panchavati College of Management and Computer Science, Panchavati, Nashik-3

Acting Principal
Panchavati College of Mgt. & Computer Science, Panchavati, Nashik-3

Panchavati College of Mgt. Comp. Science, Panchavati, Nashik-3

Publication Certificate :

Publication Certificate

Dear Contributor,

AP/E-waste/2021/1.5/6-15

Mr. Umesh Jagannath Tupe[1*] and **Mr. Deepak Shivaji Dandwate[2]**

[1]Department of Computer Science, Panchavati College of Management and Computer Science, Nashik, 422003, Maharashtra, India

[2]Department of Management, Panchavati College of Management and Computer Science, Nashik, 422003, Maharashtra, India

The editorial team is pleased to inform you that your chapter:

"Impact of E-waste on Environment: Today and Future"

is accepted for the publication in an edited book titled

"E-waste: Management and Procurement of Environment"

ISBN No: 978-93-90588-87-9.

We thank you very much for your contribution.
Thanks and Regards,

Editors:

Authorspress Q2A, Hauz Khas Enclave New Delhi-110016

Dr. Jatinder Kumar Pradhan

Acquisition Editor (Authorspress)

Panchavati College of Mgt. Comp. Science Panchavati, Nasik-3

Chapter Edited :

6

Impact of E-waste on Environment: Today and Future

Umesh Jagannath Tupe[1*] and **Deepak Shivaji Dandwate**[2]

[1]Department of Computer Science, Panchavati College of Management and Computer Science, Nashik, 422003, Maharashtra, India

[2]Department of Management, Panchavati College of Management and Computer Science, Nashik, 422003, Maharashtra, India

*Corresponding author: E-mail: umeshtupe14@gmail.com; Phone: +91-8149301190

Abstract

Today, everywhere different types of technologies are used. The rapid advancement of technologies especially the inventions of vast electronic goods made life sophisticated. From morning to night millions of people are using various electronics and electrical devices. Hence, the demand for these products increases day by day so their manufacturing becomes fast. The increasing production of electronic and electrical devices or appliances and their limited lifespan alternatively plays a crucial role in the growth of electronic waster (E-waste). The disposal of such types of goods, devices, instruments, or appliances after their use and the change of technology become key players in the creating gigantic heap of E-waste. Electronics and electrical goods contain heavy metals, glass, plastics, etc., which are the major source of environmental hazards. When such types of harmful E-waste are improperly disposed-of then it is very harmful to our environment not only today but also future. It affects sustainable development; hence the E-waste management is very important. Here, in this chapter, authors made an attempt to present the influence of E-waste on the environment in a modern era.

Keywords: Electronic waste, environment, LEDs, harmful chemical elements

Introduction

One of the emerging challenges in the developed and developing countries around the world is electronic waste or E-waste. The electronic waste consists of a multitude of important material parts, some containing harmful chemicals, which can have a

E-waste: Management & Procurement of Environment
Editors: Suresh Kumar & Jatindra Kumar Pradhan

First Published in 2021 by Authorspress
ISBN 978-93-90588-87-9

detrimental effect on the health of humans and the environment. The aim of this chapter is to give information on the sources of E-waste and its influence on the environment and living things today and in upcoming days.

Growth that is a long-term process is a very important now-a-days because various types of technologies are used by humans in various fields. This use of technologies by-default produces pollutions, due to various by-products after use, which is very harmful to the environment. In the twenty-first century, computer is the basic need of human beings, the computer is used in different applications. After damaging computer, if it is not applicable then it produced E-waste. E-waste not only produced by damage computers but also other electrical and electronic goods, appliances like CD-DVD, LEDs, microwaves, mobiles, digital watches, calculators and other discarded electronic and electric components.

Discarded electronic and electrical products and equipment's used in information technology, home appliances, audio and video products, communication, etc., are known as electronic waste or simply E-waste. E-waste is not problematic if it has safe storage or recycled from time to time but it can become hazardous if recycled by the primitive methods. Most of the E-waste in India is recycled by the unorganised sector. Proper education, awareness, cost-effective technology, and a need for a holistic approach are necessary. Prevention and control measures are necessary for E-waste pollution otherwise it will become hazardous to humans and other organisms and impact environment badly (Needhidasan et al., 2014, Li & Achal, 2020, Dasgupta, et al., 2017).

Increased use of electrical and electronic goods by a large portion of the populations and their changing habits of use are creating E-waste in India at an alarming pace. This is attributable to the side effect of rapid growth of technology. In modern times, these spectacular advances of technology have undeniably enhanced the quality of our lives. At the same time, these advancements contribute to the various problematic issues including the issue related to the hazardous waste like Pb, Cd, Be, Hg, and As, poisonous retardants flames, waste produced by computer and printer's spare parts, other waste produced from electrical goods, which has a negative impact on the sustainable development of the environment (Grant et al., 2013).

Environmental pollution can be defined as an "introduction of contaminants into the environment that makes the environment unhealthy for habitation and on the extreme can harm the ecosystem".

Pollutants are mainly two types (a) persistent pollutants and (b) non-persistent pollutants. Pollution can be described as the presence of the incorrect material in the incorrect amounts at the incorrect time. This means that if a substance is present at too low levels, it causes damage to the environment, and a pollutant is any substance that causes adverse effects or uneasiness in organisms. Persistent contaminants are pollutants that remain constant in the atmosphere for an extended period without changing their original type. Pesticides, E-waste, radioactive waste, plastics, and other chronic contaminants are the examples of persistent pollutants. Non-persistent pollutants are the polar opposite of persistent pollutants, and they degrade to their

simplest form. The chemicals are referred to as degradable pollutants if they are broken down by living organisms (Cayumil et al., 2016, Gupta, 2014 and Song et al., 2019).

E-waste is not harmful if it is properly processed or recycled from time to time, but if it cannot recycle properly, it can be risky not only present but also future. Awareness of the causes and prevalence of pollutants in the ecosystem is important for reducing the release of waste and reducing the burden on the environment and the risk to human health. E-waste is a colloquial term for electronic devices that have reached the end of their useful life. It is possible to reuse, refurbish, or recycle several of these items.

Environmental and Human Health Effects of E-waste

The severe impact of E-waste on environment and human health can be realised in the following points of discussion

1. During the summer months, E-waste becomes extremely harmful because the toxic chemicals are released into the open air when E-waste is heated by the sun rays, further destroying the already volatile atmosphere. This is one of the main environmental impacts of E-waste.
2. Heavy metals from E-waste, such as arsenic, lithium, lead, mercury, barium etc., after getting soil contaminated, then leak into the earth's crust and even further to enter the groundwater. Specifically, with lead and mercury because it has toxic effects on various organs of the human body such as the central nervous systems, reproductive systems, hemopoietic system (anemia) and genitourinary system. They inevitably find their way through wetlands, streams, rivers and reservoirs until these heavy metals enter into the groundwater. Acidification and toxification are produced in the water through these pathways, which is unhealthy for the animals, plants and communities even if they are miles away from a recycling site (Kohli & Gupta, 2015).
3. Air contamination occurs when E-waste is disposed-of informally by splitting, shredding or melting materials, exposing into the atmosphere, dust-particles etc., that cause air pollution which is severally harmful to the respiratory health of the human. E-waste of low value is often burned, but burning is also a way to obtain valuable metal from the E-waste, such as copper, aluminium and other metals. When burning of E-waste occur, the chronic diseases and cancers are at greater point of occurring. Because, burning process often releases the fine particles that can fly thousands of miles and creating various adverse health hazards for the humans and animals. The air pollution because of E-waste impacts on some animal species and the biodiversity of some regions that are chronically polluted. It can harm the quality of water, soil and plant species over time causing irreversible damage to the whole ecosystems.
4. When E-waste is improperly disposed-of in normal landfills or in the areas where it is illegally discarded, both heavy metals and flame retardants may

enter into the soil directly from the E-waste, causing contamination of the underlying groundwater or contamination of crops that may be planted, near or in the future, in those fields. The crops become susceptible to consuming these contaminants, when the soil is polluted by heavy metals, which can cause many adverse effects and resist the farmland to be as productive (Parajuly et al., 2019).

5. During the burning of E-waste more pollutants particles produced, due to their size and weight, they easily re-deposit to the ground and contaminate the soil as well. The amount of soil polluted depends on a number of variables, including temperature, type of soil, *p*H and composition of the soil. These contaminants can persist for a longer period of time in the soil and can be toxic to soil and plant micro-organisms. Consequently, for the survival of animals and wildlife species that depend on nature, will end up with eating affected plants causing internal health issues (Sivaramanan, 2013).
6. It is difficult for women who are pregnant and live in E-waste recycling areas are forming a barricade. Heavy metals and organic contaminants from E-waste, increasing possibility of premature births, decreased birth weights and lengths of babies, spontaneous abortions, stillbirths and Apgar scores (Song et al., 2019, Li & Achal, 2020).
7. During informal E-waste recycling or disposal procedures, such as uncontrolled disposal and burning of substantial quantities of persistent organic substances pollutants such as polyaromatic hydrocarbons, diphenyl alcohol, polybrominated and polychlorinated biphenyls which will be released into the atmosphere with dioxin in the natural surroundings, organic contaminants are relatively stable within living organisms and can be quickly accumulated and can migrate via food-soil or food-water chains (Li & Achal, 2020).
8. Chlorofluorocarbon gases are used in refrigerators and air-conditioners, and they contribute to ozone depletion and global warming. Increased UV radiation hitting the Earth's atmosphere, as well as increased skin cancers, would result from ozone depletion.
9. E-waste includes harmful elements such as Pb, Cd, Be, Hg, As, etc., that are hazardous to human health. In humans, the harmful health effects of these toxins include damage to the brain, heart, liver, kidney and skeletal system. It can also greatly affect the human body's nervous and reproductive systems, contributing to sickness and birth defects. Improper E-waste disposal is extremely dangerous for the global environment, which is why it is so important to raise awareness of this rising issue and the threatening implications. Printed circuit board used in different electronic appliances contains toxic substance such as mercury, polyvinylchloride (PVC), polychlorinated-biphenyls, lead, cadmium etc. These toxic substances are very harmful to human health. Because of this substance brain damage, damage of nerve system, cancer such types of health problem occur (Jhariya et al., 2014, Kiddee et al, 2013, Sitaramaiah & Kumari, 2014).

10. The lead in the soil depletes its natural nutrients and renders it sterile. Since the landfill releases particulate matter, which causes air pollution, the flora and fauna of the area around the landfill are harmed. E-waste that ends up in landfills contains chemicals that can leach into groundwater and have an effect on the local resources. Due to abnormal *p*H, turbidity, total dissolved solids, conductivity, and chloride levels, the water that was made to react with lead is unfit for human consumption. E-waste leaches into the groundwater table and affects. As a result, it has an effect on water used for domestic and drinking purposes, as even a small amount of lead in drinking water can pose a health risk to children and adults. E-waste that has been improperly disposed-of has resulted in water contamination, air pollution, soil pollution, and a hazard to humans and animals. The natural environment is being damaged as a result of the unprecedented rates at which E-waste is being improperly treated (Dharini et al., 2017).
11. Electronic and electrical equipment's are manufactured in vast amounts and will ultimately be discarded as E-waste. Because of the toxic substances they contain, the highly technical recycling criteria, the high overhead, and costs of environmentally sustainable management, as well as their negative effects on human health, these items pose a major global challenge. Low-income countries bear the brunt of negative health consequences including asthmatic bronchitis, DNA damage, endocrine and hormone disorders, lung cancer, fertility issues, genetic mutations, and so on (Hossain et al., 2015).
12. Persistent organic pollutants have a detrimental impact on human health and habitats by way of the ecological food chain. Bioaccumulation in the food chain has an impact on human health, especially in pregnant and breastfeeding women.
13. Toxic materials and heavy metals are both harmful to the atmosphere, but their release can be minimized with filtration. Additionally, supplying health services to the community to minimize the community's effect in the event that any metals escape. Toxicity levels should be tracked on a regular basis to prevent any future liabilities. Biological techniques for extracting precious metals may be used to reduce the number of harmful chemicals and metals released into the atmosphere (Awasthi et al., 2019).
14. Recycling of the components containing hazardous compounds such as halogenated chlorides and bromides, used as flame retardants in plastics which produce persistent dioxins and furans, when combusted at low temperatures is another dangerous method. When flame-retardants are incinerated, copper, this is used in printed circuit boards and cables, acts as a catalyst causing dioxin to form. As wires are sheathed in PVC, they become extremely corrosive and contain dioxin (Jhariya et al., 2014).
15. Polycyclic aromatic hydrocarbons (PAHs), a compound formed during the processing of E-waste, affects people living near waste processing sites being exposed to hazardous substances through their food. Higher PAHs levels near the waste processing areas are extremely harmful to human health (Wang et al., 2012). Tables 1 shows the sources of E-waste toxins and its influence on parts of human body.

Table 1 Influence of E-waste on Human Health

Sr. No.	E-components/ devices	Constituents	Influence organ
1	Printed circuit boards	Cadmium and Lead	Urine gladder
2	Computer	Cadmium	Kidney, liver
3	Cable insulating	Polyvinylchloride (PVC)	Immune system

Flow of Domestic E-waste in India

E-waste produced from different sources and various stakeholders are also inter-connected and subsequently, it does not follow any fixed path (Kumar & Karishma 2016, Dwivedy & Mittal, 2012). The green color flows indicate the formal recycling sector, the red indicates the informal one, and the blue stakeholders and flows are semi-formal. The status of semi-formal stakeholders depends very much on their interaction with the other stakeholders. They represent the link between the formal sectors. Direct relations between the informal and formal sector occur as well, but are less common (Skinner et al., 2010). Most of the E-waste ends up with scrap traders and dealers who, for economic reasons, commonly transfer it on to the informal sector. Figure 1 represents the flow of E-waste in India (Skinner et al., 2010, Kumar & Karishma 2016).

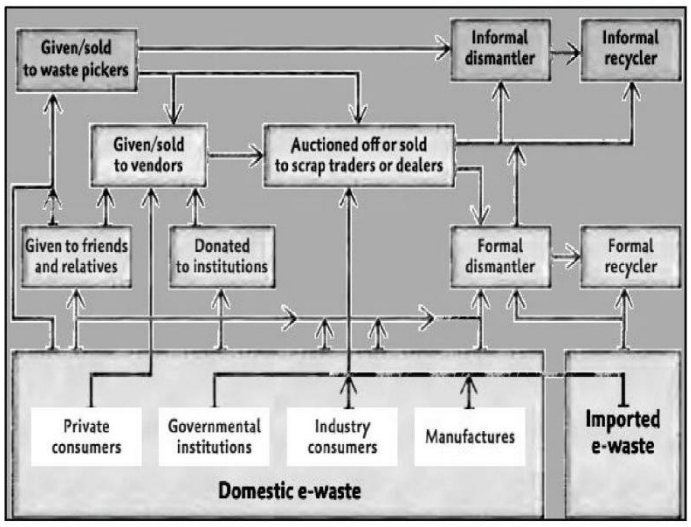


Figure 1 The Domestic E-waste Flow Chart

Steps to Minimizing E-waste

The main issue we face in so many counties is that there are no such policies or specific regulations in place to monitor E-waste recycling. Backyard practitioners recycle the majority of E-waste. Our lives and living standards are all going to be

digitalised in modern times, which on the one hand make our lives much easier but then it creates different types of other problems too. The control and recycling of E-waste must also be done with the utmost sincerity. The need for E-waste disposal stems from the fact that there is no biodegradability of old and useless electronic products. Such E-waste materials are obtained in most developed countries by scrap dealers. From them, they end up in unorganised recycling places. Owing to the lack of suitable technology, recycling and disposal is not done properly (Jhariya et al., 2014, Needhidasan et al., 2014). Minimizing E-waste conserves resources and reduces the amount of energy we use from the planet. The manufacture of these instruments, as well as the use of uncommon materials in their construction, is a significant source of embodied energy.

If we look closely before ten years, we can see that E-waste is one of the fastest – growing pollution issues in the world, growing at a pace nearly three times faster than municipal waste. The production of E-waste is increasing in tandem with the increased consumption of electronic products and their use patterns. There are no credible statistics available to measure E-waste generation in India since there is no separate collection of E-waste (Gupta, 2014).

E-waste amounts are rapidly growing, both domestically and internationally. Imports are sometimes disguised as reconditioned computer donations aimed at closing the digital divide or as scrap metal. There are no specific estimates of how much E-waste is produced and recycled. The risks of excessive E-waste disposal are not well known by producers and customers. E-waste recycling is widely practiced in the informal sector, with primitive methods like acid being used. E-waste staff is exposed to significant health risks because they have little or no awareness of the chemicals in E-waste. Material value is lost due to inefficient recycling methods. The biggest concern we have is that we don't know what to do with it (Gupta, 2014, Moletsane & Venter, 2018).

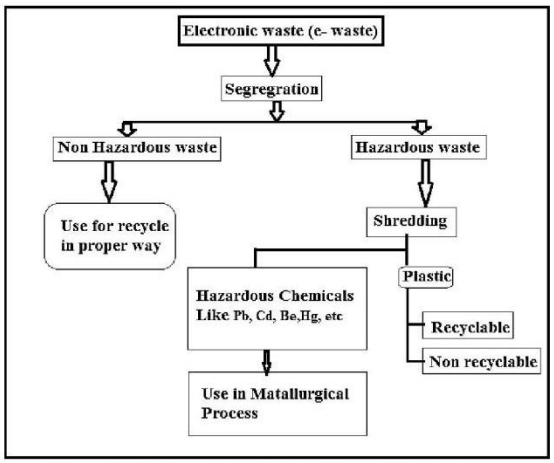


Figure 2 The Process of Recycling of E-waste

By incorporating societal, economic, environmental, technological, cultural, and gender perspectives, the global community has come together to prioritize sustainability for all developmental activities. As a result, this global integration has helped to protect the world from the degradation that occurs as living standards grow. In this vein, multilateral agreements and collaborations are crucial for achieving long-term growth. The most ambitious efforts to achieve long-term sustainability are the continuing focus on E-waste management, as well as other critical environmental concerns such as climate change and resource scarcity and degradation (Hossain et al., 2015, Needhidasan et al., 2014, Dwivedy & Mittal, 2012).

Proposed Solutions to Minimize the Problem of E-waste in Present and Future

We can follow following steps to minimize the E-waste

- Domestic legal framework for resolving these differences in E-waste imports
- Secure disposal of domestic waste needs to be tackled
- Recycle and return goods together
- Imports of used and recycled E-waste should be addressed by the system
- Attracting investment in this area
- Connecting informal sector practices to the formal sector
- Providing a fitting structure for processes
- Integrating precautionary principles and paying polluters
- Insist on manufacturing domestically
- Awareness program on E-waste recycling
- Then check to see if the company you chose can handle either E-scrap type

Limitations to Minimizing E-waste

In low-income countries, establishing safe and environmentally friendly E-waste production, such as storage, recycling, recovery, dumping, or overall management practises, is extremely difficult.

Conclusion

E-waste is a major problem on both a local and global scale. E-waste problems began in developing countries and have since spread to other parts of the globe. The amount of E-waste is increasingly increasing as consumer technology evolves at a rapid pace, resulting in rapid obsolescence and the development of significant amounts of E-waste. E-waste is made up of a variety of materials, some of which contain toxic substances that, if not properly managed at the end of their lives, can pollute the atmosphere and endanger human health. The rising global trend of E-waste generation has emerged as one of the most serious environmental concerns

and challenges to achieving long-term development. Given the potential for negative eco-toxicological effects and a wide range of health effects, a global multilateral agreement on E-waste handling, storage, transportation, recycling, and final disposal of any residual waste, whether by land filling or incineration, is urgently required. Since pollution production and transportation are global issues, international negotiations and cooperation are the only practical ways to achieve sustainable development goals. By designing eco-designed goods, properly collecting E-waste, recovering and recycling material using safe methods, disposing of E-waste using suitable techniques, preventing the transfer of used electronic devices to developing countries, and raising awareness of the impact of E-waste pollution on both customers and manufacturers, the interaction of tools will lead to E-waste management performance.

References

Awasthi, A. K., Hasan, M., Mishra, Y. K., Pandey, A. K., Tiwary, B. N., Kuhad, R. C., Gipta, V. K., Thakur, V. K. (2019). "Environmentally sound system for E-waste: Biotechnological perspectives." *Current Research in Biotechnology*, *1*, 58–64. https://doi.org/10.1016/j.crbiot.2019.10.002

Cayumil, R., Khanna, R., Rajarao, R., Ikram-ul-Haq, M., Mukherjee, P. S., Sahajwalla, V. (2016). "Environmental impact of processing electronic waste – key issues and challenges." *E-waste in transition – from pollution to resource.* IntechOpen, 9-35. Florin-Constantin Mihai. https://doi.org/10.5772/64139

Dasgupta, D., Debsarkar, A., Hazra, T., Bala, B. K., Gangopadhyay, A., Chatterjee, D. (2017). "Scenario of future E-waste generation and recycle-reuse-landfill-based disposal pattern in India: a system dynamics approach." *Environment, Development and Sustainability*, *19*(4), 1473-1487. https://doi.org/10.1007/s10668-016-9815-6

Dharini, K., Cynthia, J. B., Kamalambikai, B., Celestina, J. A. S., Muthu, D. (2017, July). "Hazardous E-waste and its impact on soil structure." In *IOP Conference Series: Earth and Environmental Science*, *80*(1) 012057. IOP Publishing. https://doi.org/10.1088/1755-1315/80/1/012057

Dwivedy, M., Mittal, R. K. (2012). "An investigation into E-waste flows in India. *Journal of Cleaner Production*," *37*, 229-242. https://doi.org/10.1016/j.jclepro.2012.07.017

Grant, K., Goldizen, F. C., Sly, P. D., Brune, M. N., Neira, M., Berg, V. D. M., "Norman, R. E. (2013). Health consequences of exposure to E-waste: a systematic review." *The Lancet Global Health*, *1*(6), e350-e361. http://dx.doi.org/10.1016/S2214-109X(13)70101-3

Gupta, M. (2014). "Environmental Effects of Growing E Waste." *International Journal of Science and Research*, *3*(11), 204-206. https://www.ijsr.net/archive/v3i12/ U1VCMTQy OTY=.pdf

Hossain, M. S., Al-Hamadani, S. M., Rahman, M. T. (2015). "E-waste: a challenge for sustainable development." *Journal of Health and Pollution*, *5*(9), 3-11. https://doi.org/ 10.5696/2156-9614-5-9.3

Jhariya, M. K., Sahu, K. P., Raj, A. (2014). "E-waste, A New Challenge to the Environmentalists." *Nature Environment and Pollution Technology*, *13*(2), 333–338. https://www.researchgate.net/publication/287859978_E-waste_a_new_challenge_to_the_environmentalists

Kiddee, P., Naidu, R., Wong, M. H. (2013). "Electronic waste management approaches: An overview." *Waste management*, *33*(5), 1237-1250. http://dx.doi.org/10.1016/j.wasman.2013.01.006

Kohli, P., Gupta, R. (2015). "Alkaline pectinases: a review." *Biocatalysis and Agricultural Biotechnology*, *4*(3), 279-285. https://doi.org/10.1016/j.bcab.2015.07.001

Li, W., Achal, V. (2020). "Environmental and health impacts due to E-waste disposal in China–A review." *Science of The Total Environment*, *737*, 139745. https://doi.org/10.1016/j.scitotenv.2020.139745

Moletsane, R. I., Venter, C. (2018) "Electronic waste and its negative impact on human health and the environment, in: 2018 international conference on advances in big data," *computing and data communication systems* (icABCD), IEEE, 2018, pp. 1-7.

Needhidasan, S., Samuel, M., Chidambaram, R. (2014). "Electronic waste–an emerging threat to the environment of urban India." *Journal of Environmental Health Science and Engineering*, *12*(1), 1-9. https://doi.org/10.1186/2052-336X-12-36

Parajuly, K., Kuehr, R., Awasthi, A. K., Fitzpatrick, C., Lepawsky, J., Smith, E., Widmer, R., Zeng, X. (2019). *Future E-waste scenarios*. StEP (Bonn), UNU ViE-SCYCLE (Bonn) & UNEP IETC (Osaka). https://wedocs.unep.org/handle/20.500.11822/30809

Sitaramaiah, Y., Kumari, M. K. (2014). "Impact of electronic waste leading to environmental pollution." *Journal of Chemical and Pharmaceutical Sciences ISSN*, *974*, 2115.

Sivaramanan, S. (2013). "E-waste Management, Disposal and Its Impacts on the Environment." *Universal Journal of Environmental Research & Technology*, *3*(5), 531-537. https://doi.org/10.13140/2.1.2978.0489

Skinner, A., Dinter, Y., Lloyd, A., Strothmann, P. (2010). "The Challenges of E-waste Management in India: Can India draw lessons from the EU and the USA." *Asien*, *117*, 7-26. https://www.semanticscholar.org/paper/The-Challenges-of-E-Waste-Management-in-India:-Can-Skinner-Dinter/927692637fb2d4587c5eca811d120958fbb0f2e5

Song, X., Lu, B., Wu, W. (2019). "Environmental management of E-waste in China." In *Electronic Waste Management and Treatment Technology* (pp. 285-310). Butterworth-Heinemann.

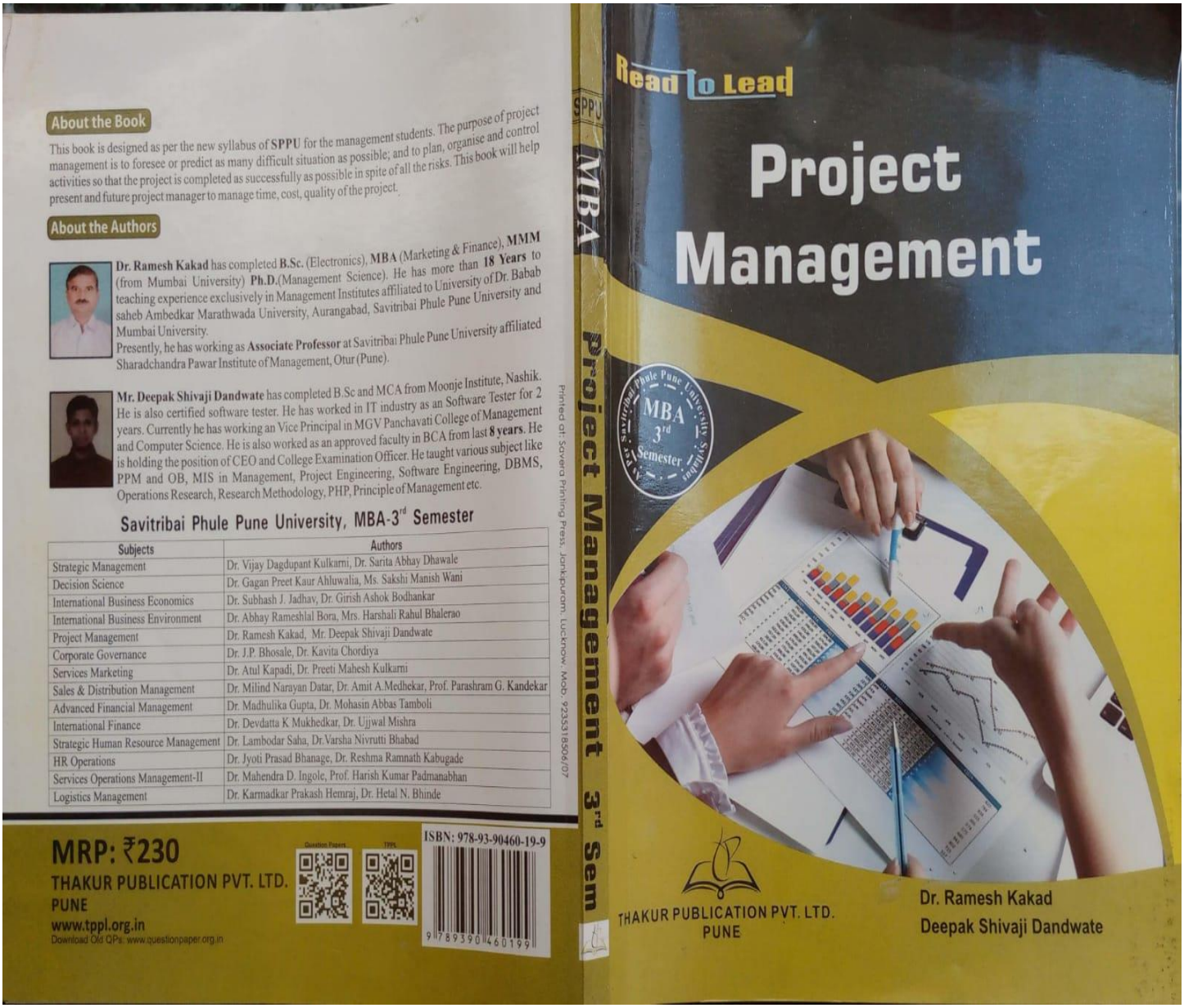
Wang, Y., Tian, Z., Zhu, H., Cheng, Z., Kang, M., Luo, C., Li, J., Zhang, G. (2012). "Polycyclic aromatic hydrocarbons (PAHs) in soils and vegetation near an E-waste recycling site in South China: concentration, distribution, source, and risk assessment." *Science of the Total Environment*, *439*, 187-193. https://doi.org/10.1016/j.scitotenv.2012.08.018

IQAC Co-Ordinator
MGV Panchavati College of Management and Computer Science, Panchavati,Nashik-3

College of Mgt. Comp. Science Panchavati, Nasik-3

Acting Principal
Panchavati College of Mgt. & Computer Science, Panchavati, Nasik-3.

4)Project Management



About the Book

This book is designed as per the new syllabus of **SPPU** for the management students. The purpose of project management is to foresee or predict as many difficult situation as possible; and to plan, organise and control activities so that the project is completed as successfully as possible in spite of all the risks. This book will help present and future project manager to manage time, cost, quality of the project.

About the Authors

Dr. Ramesh Kakad has completed **B.Sc.** (Electronics), **MBA** (Marketing & Finance), **MMM** (from Mumbai University) **Ph.D.**(Management Science). He has more than **18 Years** to teaching experience exclusively in Management Institutes affiliated to University of Dr. Babab saheb Ambedkar Marathwada University, Aurangabad, Savitribai Phule Pune University and Mumbai University.
Presently, he has working as **Associate Professor** at Savitribai Phule Pune University affiliated Sharadchandra Pawar Institute of Management, Otur (Pune).

Mr. Deepak Shivaji Dandwate has completed B.Sc and MCA from Moonje Institute, Nashik. He is also certified software tester. He has worked in IT industry as an Software Tester for 2 years. Currently he has working an Vice Principal in MGV Panchavati College of Management and Computer Science. He is also worked as an approved faculty in BCA from last **8 years**. He is holding the position of CEO and College Examination Officer. He taught various subject like PPM and OB, MIS in Management, Project Engineering, Software Engineering, DBMS, Operations Research, Research Methodology, PHP, Principle of Management etc.

Savitribai Phule Pune University, MBA-3rd Semester

Subjects	Authors
Strategic Management	Dr. Vijay Dagdupant Kulkarni, Dr. Sarita Abhay Dhawale
Decision Science	Dr. Gagan Preet Kaur Ahluwalia, Ms. Sakshi Manish Wani
International Business Economics	Dr. Subhash J. Jadhav, Dr. Girish Ashok Bodhankar
International Business Environment	Dr. Abhay Rameshlal Bora, Mrs. Harshali Rahul Bhalerao
Project Management	Dr. Ramesh Kakad, Mr. Deepak Shivaji Dandwate
Corporate Governance	Dr. J.P. Bhosale, Dr. Kavita Chordiya
Services Marketing	Dr. Atul Kapadi, Dr. Preeti Mahesh Kulkarni
Sales & Distribution Management	Dr. Milind Narayan Datar, Dr. Amit A.Medhekar, Prof. Parashram G. Kandekar
Advanced Financial Management	Dr. Madhulika Gupta, Dr. Mohasin Abbas Tamboli
International Finance	Dr. Devdatta K Mukhedkar, Dr. Ujjwal Mishra
Strategic Human Resource Management	Dr. Lambodar Saha, Dr.Varsha Nivrutti Bhabad
HR Operations	Dr. Jyoti Prasad Bhanage, Dr. Reshma Ramnath Kabugade
Services Operations Management-II	Dr. Mahendra D. Ingole, Prof. Harish Kumar Padmanabhan
Logistics Management	Dr. Karmadkar Prakash Hemraj, Dr. Hetal N. Bhinde

Printed at: Soverd Printing Press, Jankipuram, Lucknow. Mob: 9235318506/07

MRP: ₹230

THAKUR PUBLICATION PVT. LTD.
PUNE
www.tppl.org.in
Download Old QPs: www.questionpaper.org.in

ISBN: 978-93-90460-19-9

SPPU MBA Project Management 3rd Sem

Read To Lead

Project Management

MBA 3rd Semester

THAKUR PUBLICATION PVT. LTD.
PUNE

Dr. Ramesh Kakad
Deepak Shivaji Dandwate

PROJECT MANAGEMENT

MBA, THIRD SEMESTER

According to the New syllabus of 'Savitribai Phule Pune University', Pune

Dr. Ramesh Kakad
Ph.D., MBA, B.Sc., MMM
Associate Professor,
Sharadchandra Pawar Institute of Management, Pune

Deepak Shivaji Dandwate
MCA, B.Sc.
Assistant Professor,
MGV Panchvati College of Management and Computer Science, Nashik

THAKUR PUBLICATION PVT. LTD., PUNE

* Ahmedabad * Bengaluru * Bhubaneswar * Bhopal * Chennai * Dehradun * Ernakulam
* Hyderabad * Jaipur * Jalandhar * Kolkata *Lucknow * Nagpur * Patna * Rohtak *

PROJECT MANAGEMENT

- *Dr. Ramesh Kakad*
- *Deepak Shivaji Dandwate*

Published by:

Thakur Publication Pvt. Ltd.

Head Office: House No.645B/187 Abhishekpuram, 60 Feet Road, Jankipuram,
Near- Ramkishor Convent Inter College, Lucknow-226021
Mob. 9235318594/22/17, 9335318517 **Phone:** 0522-3571915

Branch Office:
Colony No.14, Ganesh Nagar Bhopkhel, Near Ganesh Temple, Po-CME, Pune-411031
Mob. 9325036341, 9326863355, 9373086387

Website: www.tppl.org.in
Email: thakurpublication@gmail.com

Books are Available for Online Purchase at: tppl.org.in
Download old Question papers from: www.questionpaper.org.in

First Edition 2020

Printed at:
Savera Printing Press
Tirupatipuram, Jankipuram Extension-226 031
Near Abdul Kalam Technical University, Lucknow
E-mail: lkospp@gmail.com, Mobile No. 9235318506/07

Contents

Unit-1: Overview of Project Management

Unit-2: Project Planning

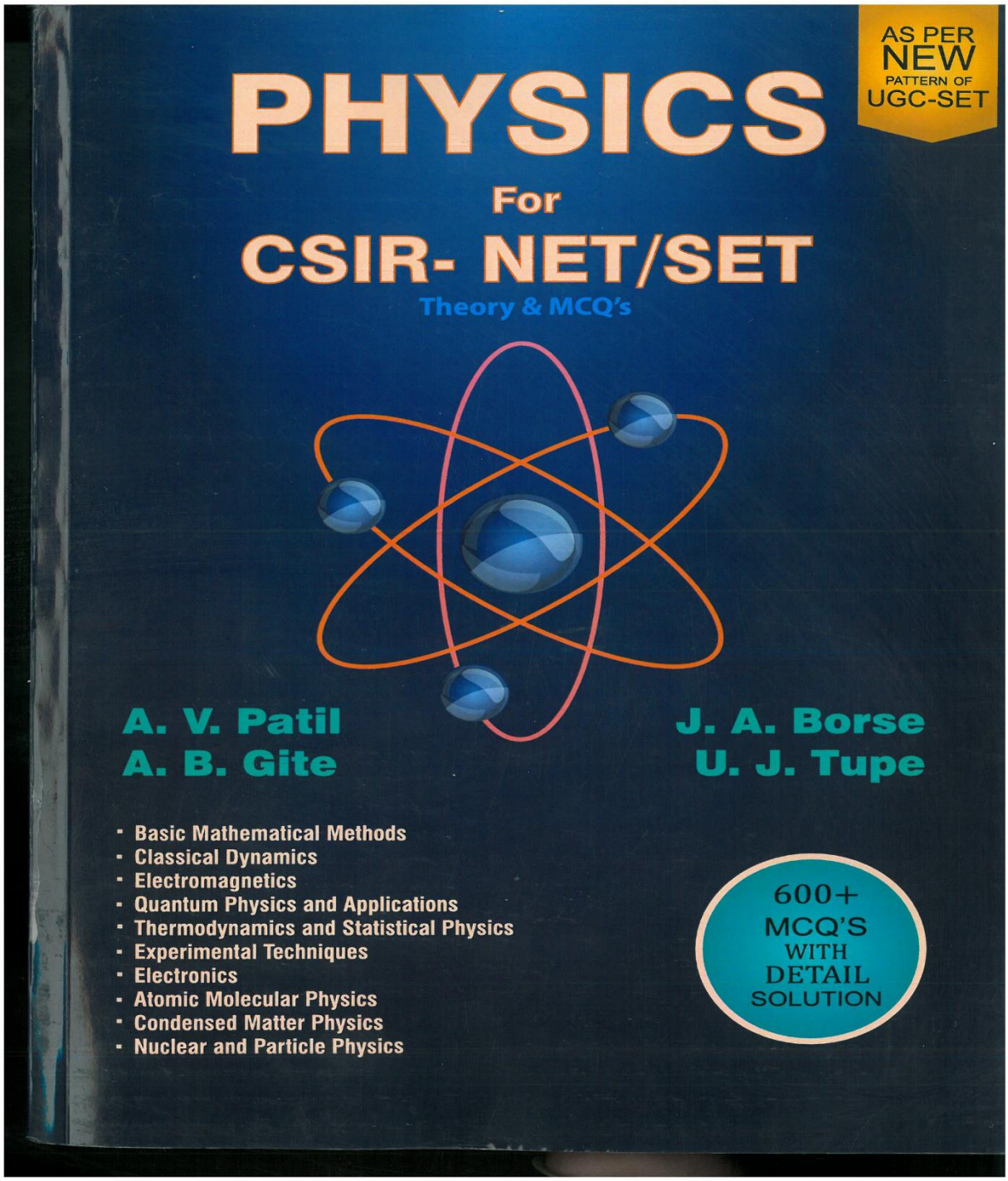
Unit-3: Project Scheduling & Risk Management

Unit-4: Project Organisation

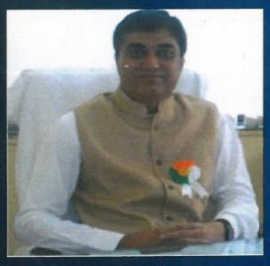
Unit-5: Project Evaluation

5) Physics for CSIR-NET/SET

Cover Page



About Author:



Dr. A.V. Patil :

Dr. Patil is Vice-Principal of L. V. H. College, Panchavati, Nashik. He is BOS member in Electronic Science for SPPU, Pune. He is Ph. D Guide in Physics and Electronic Science for SPPU, Pune. Under his guidance 06 students are pursuing Ph. D. Degree. He has 30 years teaching experience. He published 56 research articles in various reputed National and International journals. He Published 02 reference books. He attended more than 15 international conferences and more than 25 National Conferences. He worked as a resource person for various conferences. Also he worked as a reviewer for various international journals. He visited the counties like Italy, Switzerland, Hong-Kong, South Korea and Thailand. He has been awarded best paper presentation award in AMDP conference, Bussan, South Korea.

Mr. J. A. Borse :

Mr. Borse is Assistant professor in Physics at L.V.H. College, Panchavati, Nashik. He has 08 years teaching experience. He published 06 research papers in various reputed International journals. Also he worked as a reviewer for 03 international journals.

Mr. A. B. Gite :

Mr. Gite is Assistant Professor in Physics at SNJB's KKHA Arts, SMGL Comm and SPHJ Science College Chandwad, Nashik. He has published 06 research papers in various reputed international journals. He worked as reviewer for various international journals. He has attended and presented his research work in 10 international and more than 12 national conferences and participated in various workshops. He has 14 years of teaching experience in UG level and 03 years for PG level.

Mr. U. J. Tupe:

Mr. Tupe is Assistant professor in Electronic Science at L. V. H. College, Panchavati, Nashik. He has 06 years teaching experience. He published 02 research papers in various reputed International journals. He attended 06 National/International Conferences.

Vaishali Prakashan, Pune

9 788193 478189

Price Rs. 900/-

First Page:

PHYSICS

For

CSIR-NET/ SET

Theory & MCQ's

By

Dr. A.V. Patil
(M. Sc. Ph. D)
Vice-Principal,
L. V. H. College, Panchavati,
Nashik (M.S.)

J. A. Borse
(M. Sc. M. Phil. SET)
Assistant Professor,
L. V. H. College, Panchavati,
Nashik (M.S.)

A. B. Gite
(M. Sc. M. Phil. SET)
Assistant Professor,
S.N.J.B's ACS College, Chandwad,
Nashik (M.S.)

U. J. Tupe
(M. Sc. SET)
Assistant Professor,
L. V. H. College, Panchavati,
Nashik (M.S.)

First Indian Edition : January 2019

Published by : Vaishali Prakashan, Pune

Registered Office : 323, Narayan Peth
Near Modi Ganpati,
Pune-30

Sales Office : 4-Sai Prasad Row House,
Uday Colony, Cidco-4,
Nashik-422008
Mob.9890933790

ISBN : "978-81-934781-8-9"

Price: 900/-

Content Page :

CONTENTS