

# Electronic Voting in Government Elections to Promote Democracy



# Electronic Voting in Government Elections to Promote Democracy

By

K. M. Nurul Huda

**Cambridge  
Scholars  
Publishing**



Electronic Voting in Government Elections to Promote Democracy

By K. M. Nurul Huda

This book first published 2024

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Copyright © 2024 by K. M. Nurul Huda

All rights for this book reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.

ISBN (10): 1-5275-7159-9

ISBN (13): 978-1-5275-7159-4

I dedicate the book to my grandchildren Jabid, Inan, Onea, Tahim,  
and Safir, the future leaders to change the world.



# CONTENTS

Acknowledgments .....	x
Foreword I .....	xi
By Sunil Arora, IAS (Retd.)	
Foreword II .....	xv
By Yong Hi Kim	
Preface .....	xvii
Abbreviations .....	xviii
Introduction .....	1
Chapter I .....	10
Democracy and Elections	
Democracy	
Elections	
Electronic Voting Machines	
The Era of Electronic Voting Machines	
Chapter II .....	36
Voter Enrolment	
Voter Enrolment	
<i>Age of Voting</i>	
<i>National Voter Day</i>	
Afghanistan	
Bangladesh	
<i>National Identity Card</i>	
Bhutan	
India	
Maldives	
Nepal	
Pakistan	
Sri Lanka	

African Countries	
South Africa	
In a Few Advanced Countries	
Chapter III .....	69
Mature Democracies	
Mature Democracies	
Germany	
Japan	
The Netherlands	
The United Kingdom	
The United States of America	
Chapter IV .....	91
New Democracies	
New Democracies	
Bangladesh	
Brazil	
India	
Pakistan	
Russia	
The Philippines	
Chapter V .....	120
EVMs in Mature Democracies	
EVMs in Mature Democracies	
Germany	
Japan	
The Netherlands	
The United Kingdom	
The United States of America	
<i>Electronic voting in the House of Representatives</i>	
<i>Electronic Voting in Elections</i>	
Chapter VI .....	160
EVMs in New Democracies	
EVM in New Democracies	
Bangladesh	
<i>Components of EVMs</i>	
<i>Customization</i>	



<i>Settings</i>	
<i>Process</i>	
<i>Management</i>	
<i>Results at Polling Stations</i>	
<i>Voter Education and Training</i>	
<i>Demonstration and Mock Voting</i>	
<i>Compliance</i>	
Brazil	
India	
Pakistan	
Russia	
The Philippines	
Miro system EVMs	
<i>Touchscreen-based EVMs</i>	
<i>Ballot printers with built-in voter verification</i>	
Chapter VII.....	236
Verifiable Audit Trails	
Voter Verifiable Paper Audit Trails	
Voter Verifiable Digital Audit Trails	
VVPAT vs VVDAT	
Chapter VIII.....	242
Miscellaneous	
Roles of National Governments	
Roles of Election Management Bodies	
Muscle Power and Money Power	
Opposition	
Cost-Effectiveness and Acceptability	
Advantages and Disadvantages	
Success	
Storage and Maintenance	
Conclusion	
References .....	274
Index .....	285

## ACKNOWLEDGMENTS

My friends, colleagues, and family members have extended support to writing this book—thanks to them all.

Md. Mahbuber Rahman, Joint Secretary, Farhad Ahmed Khan, Joint Secretary, Br. Gen Abul Kashem Mohammad Kader, National Identity Card Project Director, Md. Ashraful Hossain, System Manager, Md. Rafiqul Hoque, System Manager; A. K. M. Mazharul Islam, Director of the Election Training Institute; and Nurul Islam, Computer Programmer, among others, of the Bangladesh Election Commission, provided information whenever I asked.

Prof. Nazrul Islam, the Chairperson of the Center for Urban Studies, has always been my source of inspiration in writing books. Prof. Muhammad Mahfuzul Islam, Ph.D., Vice-Chancellor of the Bangabandhu Sheikh Mujibur Rahman Digital University, advised me to improve the book's structure. Dr. Abdul Alim, Senior Director (Elections) of Democracy International, took a personal interest in reviewing pages of the book at the beginning.

The guidelines of Cambridge Scholars Publishing Limited have been helpful in writing a good book. Their links and write-ups are beautiful sources of information for writers.

James Brittain had exceptional patience in proofreading the manuscript to improve it at publication.

My son-in-law, Tahmidur Rahman and daughter Saida Parveen Khan, Ph.D., son-in-law, Naimul Huq, daughter Shajia Parveen Khan and Kamrul Huda Khan, and daughter-in-law Rio Tom provided me with logistic support, improving the manuscript's language and useful links for improving the text.

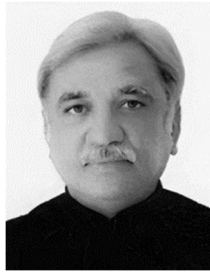
I remained away from my family while I wrote the book. My wife, Hosne Ara Huda, managed everything single-handedly. It helped pay time, month after month, to finish the book.

# FOREWORD I

सुनील अरोड़ा, भा. प्र. से. (से. नि.)  
भारत के पूर्व मुख्य निर्वाचन आयुक्त

**Sunil Arora, IAS (Retd.)**

Former Chief Election Commissioner of India



The then Chief Election Commissioner (CEC) of India, Shri S.L. Shakdar, broached the idea of introducing an electronic machine way back in 1977. Around 1980–81, this idea was given a concrete shape by the Electronics Corporation of India Limited (CECIL) and Bharat Electronics Limited (BEL) when they actually developed and demonstrated the Electronic Voting Machine (EVM). A pilot was run by the Election Commission of India (ECI) in 1982–83 when EVMs were used in 11 assembly constituencies of eight states and a union territory. However, EVMs were suspended in 1984 because the Hon'ble Supreme Court of India ruled that EVMs could not be used until the Representation of the People Act (RP Act) was suitably amended. This was done in 1988, and EVMs started getting used from 1989 onwards. The ECI, notwithstanding all the elaborate safeguards, convened an All-Party meeting in 2010 wherein it was agreed to incorporate a Voter Verifiable Paper Audit Trail (VVPAT) within EVMs. Accordingly, on 14th August 2013, the Conduct of Elections Rules, 1961, was amended to use VVPATs, and a pilot was done in a by-election in Nagaland. In October 2013, the Supreme Court allowed the ECI to introduce VVPATs in a phased manner. In an All-Party meeting in 2017, the ECI committed to ensuring a hundred percent coverage of VVPATs in

future elections, and a significant milestone was attained by a hundred percent deployment of VVPATs in Lok Sabha in 2019. Meanwhile, the Supreme Court issued directions for verification of VVPAT slips of five polling stations per assembly constituency and for assembly segment in a parliamentary constituency for greater transparency and satisfaction.

Since then, EVMs have been used in all elections, viz. four Lok Sabha and 132 state legislative assemblies. Up to September 2021, as many as 3,400 million votes have been cast on EVMs. This is incredible and by itself constitutes a world record. However, notwithstanding this, the EVMs have had a chequered history because, without exception, most of the political parties have been using EVMs as whipping boys whenever they face defeat in hustings. There are dozens/hundreds of public interest litigations in the Hon'ble High Courts and the Supreme Court of India, thanks to the rigorous safeguards and complete transparency adopted by the ECI. The usage of EVMs has stood up to all examinations by the judicial courts.

It cannot be a coincidence that a high-level Technical Expert Committee (TEC) was constituted by the ECI way back in 1990, which *inter alia* has been rigorously and transparently monitoring the use of EVMs from the stage of approval of design, vetting, and sealing the software; design improvement; and recommending improvements in the manufacturing process. They effectively function at an arm's length from the ECI. The first TEC was constituted in 1990, comprising (1) Professor S. Sampath, Chairman of the Technical Advisory Committee, Defense Research & Development Organization (DRDO), Ministry of Defence; (2) Professor P.V. Indiresan of the Indian Institute of Technology (IIT), Delhi; (3) Dr. Rao C. Kasarabada, Director, Electronic Research & Development Centre (ERDC), and Trivandrum. The second TEC was constituted in December 2005, comprising (1) Prof. P.V. Indiresan, Ex-Director, IIT Madras as Chairman of TEC; (2) Prof. D.T. Shahani of IIT, Delhi; and (3) Prof. A.K. Agarwala of IIT, Delhi. The present TEC comprises (1) Prof. D.T. Shahani, Professor Emeritus, IIT-Delhi; (2) Prof. Rajat Moona, Director IIT Guwahati, Former Director General, Centre for Development of Advanced Computing (CDAC); (3) Shri A.K. Agarwala, IIT Delhi (now Retd.); and (4) Prof. Dinesh K. Sharma, Professor Emeritus, IIT Bombay.

It is indeed heartening to know that Mr. K. M. Nurul Huda, former Chief Election Commissioner of Bangladesh, has undertaken the task of writing a book on using EVMs in elections. Mr. Huda and I have been fellow travelers meeting and interacting as the then CECs of Bangladesh and India at various regional, national, and international fora. I invariably found him enthusiastic

and keen on managing transparent elections to promote democracy. The *A-WEB India Journal of Elections* has published his scholastic articles. The book has accumulated his knowledge, experiences, and diligent research on managing elections.

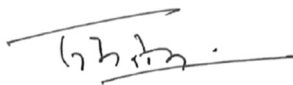
People engaged in the electronic voting process, and voters using EVMs would find the book helpful in understanding the system's requirements. The book systematically discusses the use of machines and the procedure of voting. All stakeholders, i.e., practitioners as well as users, would find necessary guides in the book. Democracy-loving people, civil society, NGOs, critics, and politicians would get exciting information from the book.

I endorse entirely the lucid description given by Mr. Huda for introducing the grounds for using EVMs in the elections, the highlights of which are:

1. *Human interference is the root of any irregularity and malpractice mentioned in this book. The EVMs can address every malpractice that happens in the manual election process.*
2. *According to the EIU Report 2022 in the Democracy Index, about 92 percent of people do not live in a full democracy. They live in flawed democracies, hybrid regimes, or authoritarian regimes. The manual process of elections could be the reason for the deteriorating state of democracy, particularly in the group of new democracies. Many EMBs of this group have opted to use EVMs in elections to improve the situation.*
3. *It seemed impossible for the EMBs to emerge from the deep-rooted irregularities a couple of decades ago. They were pondering how to find a way out. They arrived at the understanding that using technology and digitalization in the election process could make it free from irregularities. Many countries of this group, Bangladesh included, have made remarkable progress in securing the norms of fair elections by applying technology-based EVMs in the elections.*
4. *Unfair practices in the polls are widespread in the countries of new democracies. Many of them have come up with EVMs as an appropriate solution. Humans do not have much scope to intervene in the poll procedures on EVMs.*
5. *Loss of lives and property was a regular phenomenon due to violence during the elections using a manual process in the past. The occurrence of violence is reduced to almost nil in the polls on EVMs.*

In fact, I deem it a privilege and a signal honor that Mr. Huda asked me to write this foreword.

*Ghita*

A handwritten signature in black ink, appearing to be 'Sunil Arora', written over a horizontal line.

(Sunil Arora)

17.06.2023

Former Chief Election Commissioner of India

A simple horizontal line drawn in black ink.

## FOREWORD II

About 2,500 years have passed since the ethics of democracy came into being. Meanwhile, people have entered the age of civilization with the emerging global economy, infrastructural development, and politics. However, the quality of elections has not reached the desired standards in larger sections of the global population. The elections to select members in public offices are the means of promoting democracy in a country. Authentic voter enrollment is the precondition for a credible election. The book addresses these matters precisely to bridge relevancy with each. In the meantime, science, technology, and digitalization have taken the huge loads of manual jobs accurately and swiftly. The book recommends that technology and digitalization be set in the election process to promote democracy.

I learned of K. M. Nurul Huda, the author of this book, during my tenure as the Secretary General of the Association of the World Election Bodies (A-WEB), an organization of about 120 countries and territories. Mr. Huda, as the Chief Election Commissioner for Bangladesh, participated in many conferences, meetings, and discussions of A-WEB from 2017 to 2022. He was always enthusiastic about introducing technology and digital devices in the election process. I kept in touch with Mr. Huda after I retired from the position for his appreciable commitment to improving the quality of elections and promoting democracy.

He discusses that the manual election process in the paper ballots system has played a dominant role since its inception. This system has marred various irregularities everywhere on Earth in the past and present. The author is convinced that technology-based EVMs are an appropriate option to overcome the problems.

The approach in this book combines field experience, intellectual knowledge, and the author's commitment to holding credible elections. I find this book full of the conviction of Mr. Huda to consider that EVMs can be an effective alternative to bring about the desired improvement in the management of elections against the backdrop of the social, economic, political, and, more importantly, colonial, and dictatorial legacies of countries.

EVMs have been phasing out the manual process of elections that was used for hundreds of years. Their use is facing lots of criticism and opposition worldwide. It has created new platforms for debates and arguments in favor and against using EVMs in the polls. The book will be published at a time when many countries plan to introduce EVMs to improve the state of elections and promote democracy.

Yong Hi Kim

김용희

Former Secretary General of the Association of World Election Bodies  
Former Secretary General (minister grade) of the Korea National Election  
Commission



## PREFACE

I enjoyed conducting, managing, supervising, overseeing, and observing public elections from my first day in the Bangladesh Civil Service in 1973. My knowledge and experiences extended manifold while holding the office of the Chief Election Commissioner for Bangladesh for five years. The ground experiences helped me understand the behavioral patterns of citizens during elections. People from countries with mature democracies are more tolerant in favor of fair elections, but those from the new democracies lack such an approach.

Many countries have introduced technology-based EVMs in elections since the 1980s, including Bangladesh in the 2010s. The Bangladesh Election Commission devoted time and energy to making EVMs successful. I had the pleasure of being an active part of it with conviction. My position has privileged me to interact with EVMs with the election management bodies worldwide. The use of EVMs is successful in countries with new democracies. Countries with mature democracies also have scope to benefit from them. This stock of knowledge and conviction to advance democracy through elections with EVMs persuaded me to write the book.

The book aims to phase out the ballot-paper system in the manual process of elections by analyzing the transition of democracy through the passage of time. It argues that to make it fair, EVMs can reduce human interference responsible for malpractices in elections.

Democracy-loving people will need this book to pursue the benefits of using EVMs in the polls. The book has provided new directions to improve the quality and standards of elections to promote democracy.

## ABBREVIATIONS

ARO	Assistant Presiding Officer
BEC	Bangladesh Election Commission
BEL	Bharat Electronic Limited
BMD	Ballot-Making Device
BMTF	Bangladesh Machines Tools Factory
CCTV	Close Circuit Television
CMLA	Chief Martial Law Administrator
CEC	Central Election Commission
COMELEC	Commission on Elections (Philippines)
CPLP	Community of Portuguese Countries
DRE	Direct Recording Electronic Computer
EAC	Election Assistance Commission
ECI	Election Commission of India
ECIL	Electronic Corporation of India Ltd
ECP	Election Commission of Pakistan
ECS	Election Commission of Sri Lanka
EIU	Economist Intelligence Unit
EMB	Election Management Body
EOM	Election Observation Mission
EVMs	Electronic Voting Machines
FEC	Federal Election Commission
FEMBoSA	Forum of Electoral Management Body of South Asia
GIS	Geo-Information System
GoB	Government of Bangladesh
HAVA	Help America Vote Act
ICT	Information Communication Technology
IDEA	International Institute for Democracy and Electoral Assistance
IEC	Independent Election Commission (Afghanistan)
IFES	International Foundation for Electoral Systems
IPA	Innovation for Poverty Action
MoI	Ministry of Interior
MP	Member of Parliament
NADRA	National Database and Registration Authority

NDI	National Democratic Institute
NID	National Identity Card
NVD	National Voter Day
OAS	Organization of American States
PEC	Percent Election Commission
PERP	Preparation of Electoral Roll with Photograph and Facilitating the Issuance of National Identity Cards
PIDE	Pakistan Institute of Development Economic
PIN	Personal Identity Number
PO	Presiding Officer
RO	Returning Officer
RPA	Representation of People Act
RPO	Representation of the People Order
SAS	State Automated System
SD card	Secured Digital card
SVEEP	Systematic Voters' Education and Electoral Participation
TEC	Territorial Election Commission
TSE	Tribunal Superior Electoral
UK	United Kingdom
UNIORE	Inter-American Union of Electoral Organizations
USSR	Union of Soviet Socialist Republics
US	United States
USA	United States of America
VPN	Virtual Private Network
VVDAR	Voters' Verifiable Digital Audit Trail
VVPAT	Voters' Verifiable Paper Audit Trail
WOLA	Washington Office on Latin America



# INTRODUCTION

Democracy, elections, and voters are integral parts of the system of changing government in a democratic society. Democracy is the rule of the majority. Voters choose the majority to rule a country. The election places the majority in power. An election aims to establish the people's rights in the government. Free and fair elections by legitimate voters are the means to advance democracy in a country. Hence, democracy, elections, and voters are concomitant terminologies in forming the government after a tenure set under the laws of respective countries. Each of these three topics covers vast areas in the literature on politics. An elaborate discussion on any of these topics is beyond the capacity of this book. The book brings up only the pertinent issues in their relations.

Precisely, democracy in politics is sustained through the process of voting by the people in the elections to change the government. Elections also play a role in other organizations in democratic societies. However, the book focuses only on the exercise of democracy and the process of changing government via election in a country. It will discuss the types and forms of democracy and elections, which are different in different countries.

Many countries have achieved the expected standards of democracy through prolonged exercise, while others are behind. People in some countries under the banner of democracy still apply undemocratic means in the process of elections to capture state power. It undermines the election process and frustrates the promotion of democracy. The syndrome of undemocratic behavior is not limited to applying physical force alone. It also includes using money, setting up illogical strategies, intimidation, creating an environment of fear and favor, manipulating poll results, and other illegal activities.

The main arguments laid down in this book show that the practice of democracy varies from country to country. Developed countries have achieved high standards in the election process in favorable environments through practices of long years. Developing countries have suffered from colonial or dictatorial rule, lacking the fair practice of democracy owing to their backward political and socio-economic conditions. That is to say, the level of democracy in developed countries and developing countries is not

the same. This is why the requirements for using technology in the election processes in the two groups of countries are not the same either. The democratic countries in the world are thus grouped into two to understand the reasons for the difference and suggest ways for improvement.

The first group comprises countries with longer and more stable democratic exercises through free and fair elections for changing public offices. Germany, Japan, the Netherlands, the United Kingdom, and the US are taken as representatives of the countries with similar backgrounds in the first group. This group can be termed the “countries with mature democracies.” They have come through the malpractices in the elections that prevail in the countries with new democracies. These countries took hundreds of years to reach the stage they are at today.

The second group comprises Bangladesh, Brazil, India, Pakistan, Russia, and the Philippines, representing other countries with similar backgrounds. This group can be termed the “countries with new democracies.” These countries have come through colonial backgrounds or dictatorial rule. The colonizers denied the citizens the democratic right to choose representatives in their governments through elections. The natives remained in the dark about the exercise of democracy for forming the government. As a result, a proper culture of democracy could not grow in them. They have inherited disturbing lessons from the colonial or dictatorial rulers in the practice of democracy. Historically, the level of education has been low, and the incidence of poverty is high among the citizens of this group of countries. These factors have affected their way of livelihood, democratic behavior, and other forms of civic manners.

The book discusses the past and present state of democracy and election procedures in five countries of the first group and six countries of the second group to illustrate similar situations in other countries in the respective groups. The book also discusses the use of electronic voting machines (EVMs) in the polls in these countries and their influence on the quality of the elections.

Several countries of the second group, with very large democracies, successfully use EVMs in their elections. More countries of this group are inclined to introduce electronic voting systems to improve the process by making it free from human interference. These countries need technology to address the problems believed to happen due to the manual process.

The book has highlighted that the US was a leading pioneer in establishing democracy worldwide, even though it remains excluded from the list of the best practitioners of democracy in recent times. The situation suggests that the federal government is responsible for conducting national elections instead of depending on the states.

The absence of uniform systems in the federal nature of elections in the US obstructs good elections. Later chapters in the book discuss that the national elections need to be managed by a federal body under federal laws, not by the individual states. Again, using old and outdated electronic machines to manage elections was responsible for creating controversial poll results. Americans have ample ability to use electronic technology and digital devices in the management of elections to address the controversy they are facing.

The book argues, by analyzing the history of democracies and shedding light on the state of the conduct of elections, that EVMs can change the current landscape and have a positive impact.

The book is designed to influence governments, electoral management bodies (EMBs), stakeholders, citizens, and others about the benefit of using EVMs in elections, which can be achieved by

- a. introducing technology and digital devices in the polls to phase out the paper ballot systems;
- b. marginalizing the manual process in the polls by reducing human interference;
- c. developing an environment by using EVMs where the citizens can exercise democratic rights in the polls;
- d. incorporating voters' verifiable paper audit trail or voters' verifiable digital audit trail in the EVMs to ensure transparency in the system and
- e. bringing about qualitative improvement by introducing technology and digital devices in the election process.

The critics of using EVMs in elections say:

- i. The EVMs can be hacked to change the poll results;
- ii. The voters are skeptical about post-poll auditing and recounting in the absence of paper records;
- iii. It is not sufficiently transparent and lacks the trust and confidence of the citizens;

- iv. The manufacturers can make a purposeful program in the machines for tampering, and
- v. Safe storage of results clouds doubt.

The book discusses these areas of concern where relevant. It will show that these concerns are well addressed to justify that EVMs can work better to improve the quality of elections, particularly in countries with new democracies.

The book is composed of eight chapters.

Chapter I discusses democracy, elections, and requirements for using EVMs in the polls. Chapter II looks at voter enrolment. Chapter III explores the so-called mature democracies, whereas Chapter IV looks at democracy in countries where it is a newer phenomenon. Chapters V and VI explain the use of EVMs in the mature and new democracies, respectively. Chapter VII outlines the post-poll voters' verifiable systems and elaborates on miscellaneous subjects that include the roles of a national government, the roles of EMBs, the use of illegal force and money to win elections, and other pertinent areas.

A short description of the foundations of each chapter will now be given chronologically.

Chapter I discusses democracy as the concept of selecting representatives for public offices through voting by the people. It presents the historical background of democracy and elections, stating that these terminologies are thousands of years old.

The practice of democracy through elections was found in ancient Greece and ancient Rome. It was also found in medieval Bengal during the reign of Pala King Gopala (750s-770s CE). Citizens, in general, were not a part of electing the rulers at that time.

The Magna Carta of 1215 and the English Bill of Rights of 1689 influenced the US to establish people's rights in government functions. The US then passed the US Bill of Rights in 1791. The US Bill of Rights comprises ten amendments to the Constitution. The amendments guarantee personal freedom and rights and the power of the people to choose the government. The importance of democracy spread in other Western countries over a long period, becoming more acute in the 19<sup>th</sup> century. The road to democracy in other parts of the world opened with the passing of the US Bill of Rights. It



gained momentum following the end of World War II with the independence of many colonial countries.

Underprivileged sections of people and women were not a part of electing representatives in the government at the beginning of democratic practice. People with better social backgrounds and financial solvency were enrolled for electing representatives in public offices even with the passing of the English Bill of Rights and the US Bill of Rights. Color, creed, race, sex, and social status played roles at that time. Black people, enslaved people, and women were barred from the affairs of states. Indeed, it was not universal. Gradually, it became universal through the approval of women's suffrage and universal adult suffrage.

Thousands of years have passed since the concept of democracy came into being. Yet democracy is not at its full strength. According to the Economist Intelligence Unit Report of 2022, only 24 out of 167 countries achieved the status of full democracy. Many countries of mature democracies, even the US, could not secure a position on the list of countries with full democracy.

The manual process of elections using paper ballots dominated the polls from the time it started in the 1690s until the 1880s when a mechanical system of voting and counting votes was introduced in the US. The US was using a computerized system to count votes, one step forward from mechanical design, in the 1930s.

Science and technology emerged to replace huge areas of manual labor, shortening time, reducing cost, giving accuracy, and providing quality products. EMBs did not miss the train of such an opportunity. Computer scientists designed EVMs to conduct elections to reduce anomalies. India introduced such technology-based EVMs in state legislative elections in 1982. They accepted EVMs as alternatives to paper ballots in the manual election process. They replaced paper ballots with EVMs from the country's national and state legislative elections by 2019. Electronic voting systems spread in different countries within a short period.

Chapter II discusses the process of voter enrolment in different countries. The countries of the first group use the government's population database to register voters. The polling staff in some digitally advanced countries use online voter verification on Election Day. Citizens of other similar countries show voter cards, driving licenses, passports, social security cards, or other authentic documents for proof of identity and can vote.

Most countries of the second group do not have an authentic database of the birth and death of citizens. They need to register voters manually and mostly annually. The Bangladesh Election Commission (BEC) has prepared a biometric voter enrolment with a photograph of each voter. At the same time, it has produced smart national identity cards (NIDs) for all voters. They act as voter cards. Both are essential tools and integral parts of stopping impersonation at the time of the polls.

The state of democracy and the election process in Bangladesh have broader references in the book for two reasons:

- A. The author is better acquainted with the elections in Bangladesh from his practical experiences and
- B. The examples in Bangladesh resemble the situations in other countries with new democracies because of their homogeneous socio-political realities.

South Asian countries and others with similar backgrounds collect particulars of voters by visiting every house. They try to ensure that no genuine voter is left out of enrollment. Many countries have entered a biometric voter registration system to prevent fake voting. A citizen below the age limit determined under the laws of the respective country is ineligible for voting. Registration of voters invariably records the correct age of voters in the enrolment.

South Asian countries update voter enrollment every year. Most EMBs of these countries have earmarked a calendar year for celebrating Voter Day in a befitting manner. They start collecting particulars of eligible voters from the “earmarked day,” examine and reexamine the information at various stages, and finally publish the list for inclusion in the enrolment.

Chapter III discusses the situations of public elections in the countries of the first group. They were not free from unethical activities in elections in the past. For example, corrupt practices played foul roles for hundreds of years in the elections in England and the Netherlands. They enacted several laws with provisions for imprisonment and fines for the offenders. They made the situation acceptable by implementing the laws through conventional procedures. But it took about 200 years, or even longer, to reach the stage they are at today.

The EVMs moved in as a tool to reduce irregularities in the election procedures. The requirements for using EVMs in elections differ widely in

the two groups of democracies. The countries in the first group do not have many irregularities in managing elections. The EVMs have very little room to improve the quality of elections in these countries. They no longer suffer from corrupt practices like voting rigging, buying, or manipulation. They need accurate, swift, and cost-effective outcomes from using EVMs.

Chapter IV discusses the social, political, and economic standards of the second group of countries that could not grow at the same rate as the developed countries due to their colonial legacy. During the elections, they inherited violence, malpractices, and wrongdoing from colonial rulers. These countries suffered from multiple irregularities in the elections, like vote rigging, capturing of polling booths, stuffing ballot boxes, manipulation of results, and similar offenses. Human interference at every stage in the manual process of elections is seen as responsible for causing irregularities. These countries' governments and EMBs work together to improve the election process.

Years have passed, but the conventional way of applying legal instruments proved futile in curbing the wrongdoings in the polls in the second group of countries. The EMBs of many democratic countries opted to use technology and digitalization at various stages of elections to improve the situation.

Chapter V discusses that election-related problems in the countries of mature democracies are not worthy of being worried about. They no longer have a high degree of malpractice in the election process. Nevertheless, the EMBs of many countries of this group tried EVMs in the 2000s to cast and count votes swiftly and accurately. Most of them could not continue it due to local opposition. They had legal, managerial, and financial problems and faced apathy from the national government to support EVMs. However, the EVM as a technology was not found to be at fault. The situation has created ground for debate on returning to using EVMs in the elections in the near future.

Chapter VI focuses on the requirements for using EVMs in the elections in countries with new democracies. The citizens of this group have inherited undemocratic behavior from colonial or dictatorial rulers. The manual process of elections in these countries suffers from various malpractices caused by vested interested groups. The deep-rooted irregularities in the management of elections in these countries need technological and digital treatments. The use of EVMs is regarded as the best solution to overcoming malpractice in the election process in these countries. The chapter also

discusses customization, the setting of machines, and the process of casting and counting votes in the EVMs.

The BEC has used EVMs in the elections in a few parliaments, many parliamentary by-elections, and hundreds of times in local government elections. The BEC provides training to the polling staff on the function of the EVMs and education to the voters about the use of EVMs. Its settings, function, the counting of votes at polling stations, making the results public on the day of elections, the conduct of voter education on the use of EVMs, and other related issues have been discussed in the context of using EVMs in the elections in Bangladesh as examples.

Chapter VII discusses the incorporation of paper audit trails in the EVM. It has enabled the post-poll auditing and recounting of votes. The BEC uses a Voter Verifiable Digital Audit Trail (VVDAT), and the Election Commission of India (ECI) uses a Voter Verifiable Paper Audit Trail (VVPAT) in their polls. Both serve the same purpose of transparency when voting to ensure the voter has voted for the intended candidate(s).

Chapter VIII discusses how the collaborating roles of the countries' governments and respective EMBs are essential for using any new system in elections. This chapter mentions many success stories in the use of EVMs in elections.

The central government in the federal system makes the legal procedures and other processes of national elections to bring them under the administration's remit. They have one set of legal instruments, uniform voter enrolment, and sufficient financial and administrative support from the central governments to conduct national elections.

The regulatory framework in the conduct of national elections in the US is different. The federal government of this country has a small area of authority to deal with the elections. It does not have a uniform system for managing national elections. Critical issues like systems of election management, registration of voters, approval of design and model of electronic voting equipment, authentication and verification procedures of voters at the polling stations, and budgetary support are devolved to the state or even county levels. The states use technology and digitalization in stages of the election process, but not uniformly, but sporadically. The states do the jobs under their respective legal, financial, and administrative capacities. These are the issues for the controversial outcomes in the elections in the

country. The US is working to find ways and means to improve the status of its national elections by making laws.

Any new initiative in the affairs of public offices passes through opposition. The EVM is a modern technology that challenges the several-hundred-year-old paper ballot system and manual election process. Obviously, EVMs are not spared from criticism. Critics from different corners and angles have attacked EVMs to dislodge them from the systems of public elections. The EMBs concerned have encountered the opposition logically with a determination to set EVMs in the conduct of elections. Some countries of mature democracies have abandoned EVMs not for their erratic functions but due to internal problems.

The influential candidates in the countries with new democracies use musclemen and money to win the elections. The EMBs of these countries have fixed up many odd situations surrounding elections by instilling trust and confidence among the stakeholders. The EVMs have primarily addressed these problems by allowing voters to choose their desired candidates. The use of EVMs has contributed to an environment of credible elections, thus establishing the spirit of democracy. A better situation in the management of elections has become visible in these countries compared to past scenarios.

Many people who are working on the ground believe that it is cost-effective. Others believe that using EVMs may not be cost-effective initially, but it would reduce costs in the long run.

The people of both groups of democracies have similar opinions about the success of EVMs in elections. The people who have seen the procedure of setting the machines up in the polling booths, an operative system of EVMs by casting votes and handling them while taking and counting votes, found it a better strategy than the polls in the paper ballots.

# CHAPTER I

## DEMOCRACY AND ELECTIONS

Brief backgrounds on democracy and elections are drawn in this chapter to understand their transitions from ancient times to the technology and digitalization of the modern day. The concept of democracy is thousands of years old. Different authors define modern democracy as a system of government constituted of representatives chosen by the voters in elections. In other words, the people choose their representatives through elections to form a government in democratic countries. Free, fair, and transparent elections are the foundation of democracy. Most EMBs have conducted elections using a manual process in a paper ballot system. The manual process is responsible for human interference in elections. Human interference is the root cause of anomalies before, during, and after the polls. Technology and digitalization in electronic voting systems have taken over the manual process in many countries, phasing out paper ballots from elections in the recent past.

### **Democracy**

Conventional manual procedures were the only systems to deal with the progress of democracy in ancient times. They lasted centuries until science and technology took over some jobs to exercise democracy. The transition of democracy from the past to the modern technological and digital age needs a brief discussion to understand the stages of its advancement and the changes it has undergone.

Democracy has been through many transitions in the thousands of years since the Greek society conceived the term for choosing the rulers in government in 508 BCE. The practice of democracy at that time was limited to the cities, not among the people of the entire territory of Greece. The country's citizens outside the city were not considered a party in such a democratic exercise. Again, the exercise of democracy and elections therein was in the hands of aristocratic society at that time. An elite section of people comprised the voters able to elect the members of government offices. The common people generally had no say or role in such elections,