Open Electronic Election Systems

Achieving public trust through transparency and openness

Democracy, Elections, Legitimacy

- Legitimate elections provide the basis for all democratic institutions
  - Elections are difficult to organize and conduct
  - Integrity of elections is central to implementing democracy
  - Especially in developing countries trust in the process and systems used is fundamental and can be easily lost
- The way elections are organized can transform societies
  - Empowerment of women and minorities
  - Representing all segments of society (e.g., migrants)
  - In mountainous countries election face additional challenges
    - Remote areas
   - Traditional societies
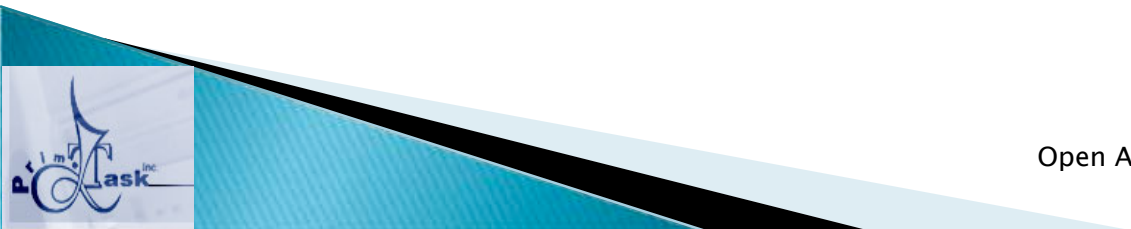
Election Process
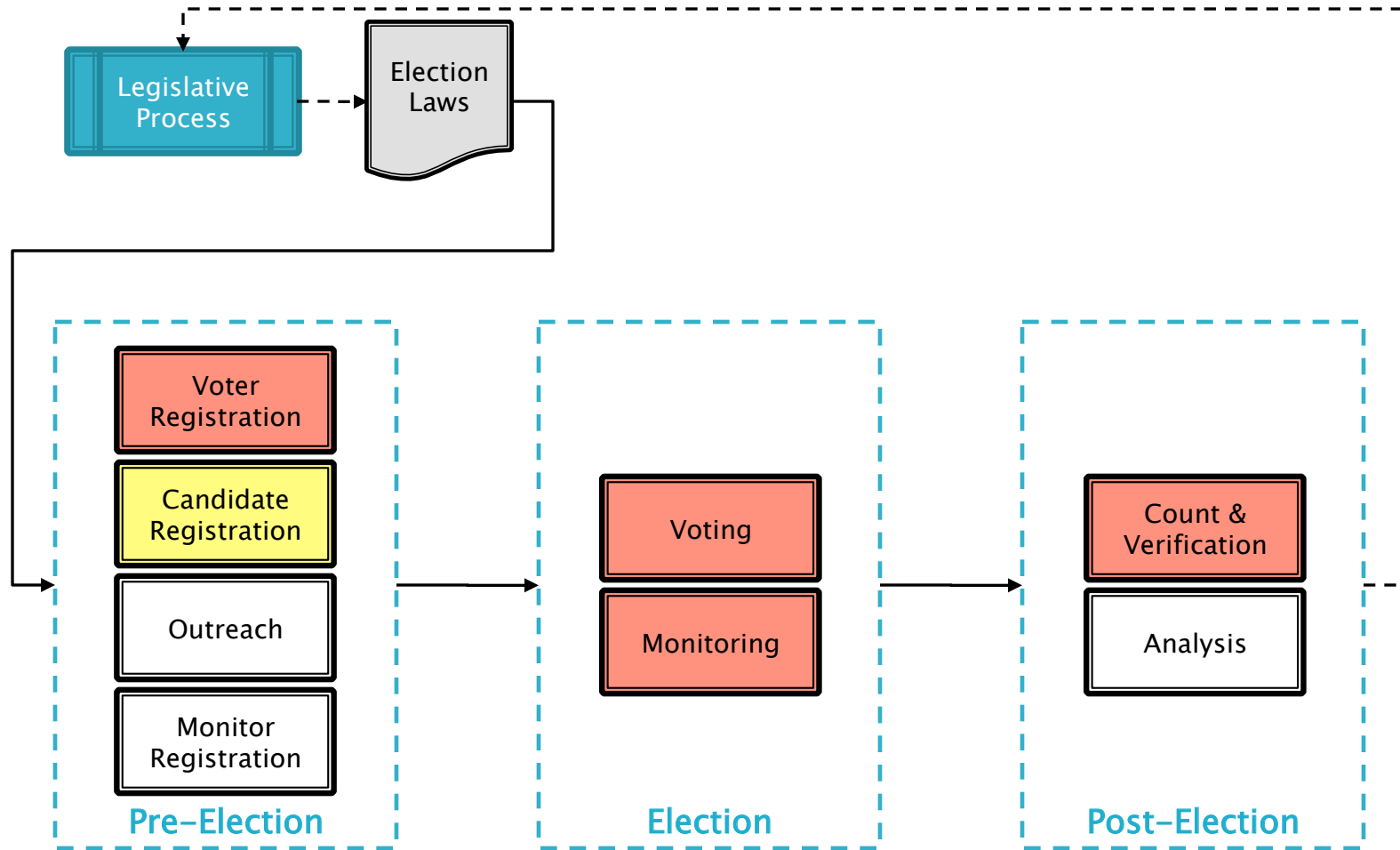
Inherent Contradictions in Elections

▸ Election system (understood as people, organizations, laws, procedures, and material resources involved in elections) are always less than perfect implementations of a philosophical ideal of determining the will of the people.

◦ There are fundamental contradictions embedded in all election systems

◦ Modern technology (electronic e-voting systems) may be very effective in resolving specific issues but does not change the fundamental difficulties

Inherent difficulties/contradictions

▸ Some desirable election characteristics may contradict other goals
  ◦ Secrecy/anonymity (assumed to be mostly a desirable feature) varies inversely with verifiability, i.e., the more secret is the vote or the fact of participation the more difficult it is to verify results
  ◦ Other contradictory pairs
    • Verifiability – Coercion-free
    • Strict registration – Ease of participation
    • Ease of participation – Fraud prevention

▸ Technology may partially resolve some of the contradictions, e.g., make it easier to both register and participate
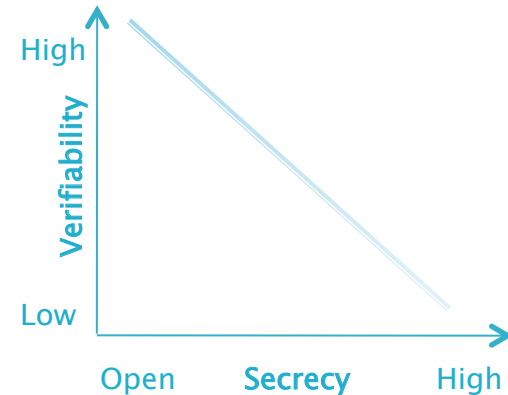
Examples of technology-based solutions

- Solutions can be designed to address specific threats, such as
  - Vote suppression (intimidation/violence at polling places)
    - Use of remote solutions, e.g., web or mobile networks
  - Voter coercion (violent demands to vote for specific candidates
    - Provide ability for a voter to view/demonstrate the result differently, e.g., multiple passwords to display actual and "fake" votes
    - Ensure privacy at the moment the vote is submitted, e.g., by detecting presence of more than one person
  - Ballot stuffing
    - Ensure that votes can be submitted only one at a time, making it time consuming to enter false votes and increasing the probability of detection
- Other solutions can address structural problems
  - Electronic registration and voting can be done at any polling station
  - In traditional societies, remote voting can increase participation by women
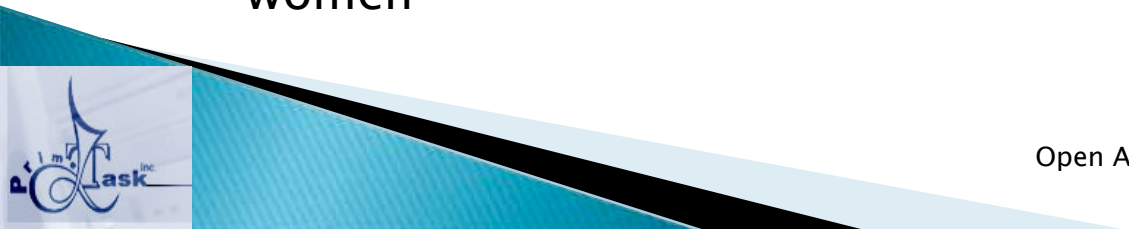
Leveraging electronic systems

- Electronic systems have potential to improve every component of the election process, e.g.,
  - In voting, traditional systems have relatively short voting period in order to minimize fraud opportunities. Electronic systems can support uniform long voting period
  - Electronic systems may incorporate support for collections of signatures in candidate registration, the activity that in itself is often contentious and a source of public mistrust
  - Electronic systems can provide self-assessment and support external pervasive monitoring (rather than selective monitoring)

Current implementations of e-Voting

- ## Current approach relies on proprietary, closed implementations
  - The systems are certified by vendors but are provide no or limited means of independent verification
    - Gaming systems are controlled more tightly than election systems
  - The close nature of the systems is supposed to make it more difficult to tamper with but has detrimental side effects
    - Makes it nearly impossible to detect intrusion or hacking when such occur
    - Diminishes public trust in elections

Case Study: Kyrgyzstan

- Elections under new constitution were held on October 10, 2010
  - Official results required an almost two-week recount
  - 5 of 29 parties 5 exceeded the 5% threshold
- OSCE and ENEMO assessment of the elections noted the problems with counting
  - Procedural violations, problems with completing protocols
  - Inconsistent legal framework for elections, "…in urgent need of comprehensive reform"
  - "The quality and accuracy of voter lists (important for calculation of thresholds) remained a serious concern"
  - "Deficiencies in the residency registration system resulted in the disenfranchisement of thousands of internal migrants and people displaced by the June violence."
  - Violations of ballot secrecy
  - presence of unauthorized persons in polling stations
- Inaccuracies and changes in the initial list (adjustment by 200,000 of the total registration lists) had severe effect on the composition of the Parliament due to thresholds system
- Mandatory preliminary registration and other restrictions made participation by migrants (estimated 600,000 voters) difficult
  - Kyrgyz migrants are usually very active politically
  - Of the 375,000 Kyrgyz migrants in Russia, less than 60,000 could vote

Case Study: Kyrgyzstan

- Electronic voting technology (E-voting) can be effective in Kyrgyzstan.
- E-voting is already widely used in Europe, Americas, and Asia
  - Estonia has successfully implemented an on-line e-voting system (this type of e-voting may be especially effective in resolving the problems of participation for migrant workers both inside Kyrgyzstan and abroad)
  - Unfortunately, many of these systems are proprietary and closed ones, which will never do as a basis for public trust in country where populace is extremely and justifiably suspicious of corruption. Again, maximum openness and involvement of different organizations and NGOs in the design and fielding of the system can help.
- Implementation of a modern election system in Kyrgyzstan requires political will, investments (especially, for the extremely high data and communication security requirements), legislative and regulative framework, organizational and social arrangements in addition to technological infrastructure.
  - It will require a holistic approach that includes legal and technological solutions to other E-Governance projects (e.g., links with civil registry and migration system for accurate data of the potential voters; electronic or mobile identification cards with smart chips). E-voting system must be considered within the comprehensive framework for Electronic Governance in order to ensure high impact and benefits for the society, effective return of the investments achieved by integrating with the other systems at the design stage and during development as well.

Developing Open Election Systems

▸ National systems must be designed in an open democratic process that acknowledges the difficulties present in different approaches and makes reasoned and known trade-offs appropriate for local conditions

▸ A comprehensive set of stakeholders must be involved in the process from the start, e.g.,
  ◦ Central Election Commission,
  ◦ Executive and legislative branches
  ◦ representatives of all parties,
  ◦ local and international NGOs (e.g., IFES, Human Rights Watch)

▸ Laws must be adjusted to separate purely legal framework from technological implementation

▸ The emphasis for the design should be transparency and monitoring as general principles
  ◦ More detailed requirements and features (e.g., use of biometric identification for registration and voting) need to be determined through the same open design process and public discussion as described above.

▸ Most countries would need a combination of traditional and electronic systems
  ◦ A mixed implementation would allow for an incremental development and deployment;
  ◦ A pilot project can be limited to a specific population segment (e.g., migrants) or a geographical location (e.g., Osh) that would benefit the most from an updated system.

Design Principles

▶ Comprehensive
  ◦ Uniform support for complete election cycle
▶ Modular
  ◦ Independent development of major modules
  ◦ Gradual deployment and pilot projects
▶ Open
  ◦ Based on open standards/specifications, design model, and source code
▶ Collaborative
  ◦ Involving all stakeholders (government, civic society, and industry) in all phases
▶ Configurable
  ◦ Able to use different technologies (mix of electronic voting machines, web, paper, etc.)
  ◦ Able to accept parameters (date, times, registration/voting rules, verification choices, etc.)
  ◦ Able to represent the election laws as computable rules and as natural language statements
▶ Built-in self-assessment and monitoring
  ◦ Able to assess and report the status of the system and to verify the integrity of all software modules
  ◦ Supports full external monitoring, remote and local
  ◦ Supports public monitoring
  ◦ Provides monitoring information in accordance with the privacy/secrecy restrictions
  ◦ Includes information on monitoring activities (i.e., who is monitoring what)
▶ Scalable and shareable
  ◦ Ability to support elections at different levels
  ◦ Ability to share resources between different jurisdictions/countries

What to do

- Organize an open source group dedicated to development of election systems
  ◦ Target developing countries
  ◦ Seek partnership with industry and universities in the developing countries, e.g., American University in Central Asia
- Identify partners among developing countries and international development organizations
  ◦ Kyrgyzstan is one possibility – it already expressed interest
  ◦ UNDP
- Contact international and local NGOs involved in monitoring elections
  ◦ IFES, Human Rights Watch, ASF
- Establish a working group with all stakeholders
- Identify desired adjustments in electoral laws
  ◦ Concentrate on separating legal and technical aspects of elections so that the technologies can be fully leveraged in proposed solutions