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The Design, Development and Deployment of an Electronic Immunization Registry: Reflections and Guidance from Vietnam

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The faces behind the webinar....



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Agenda:

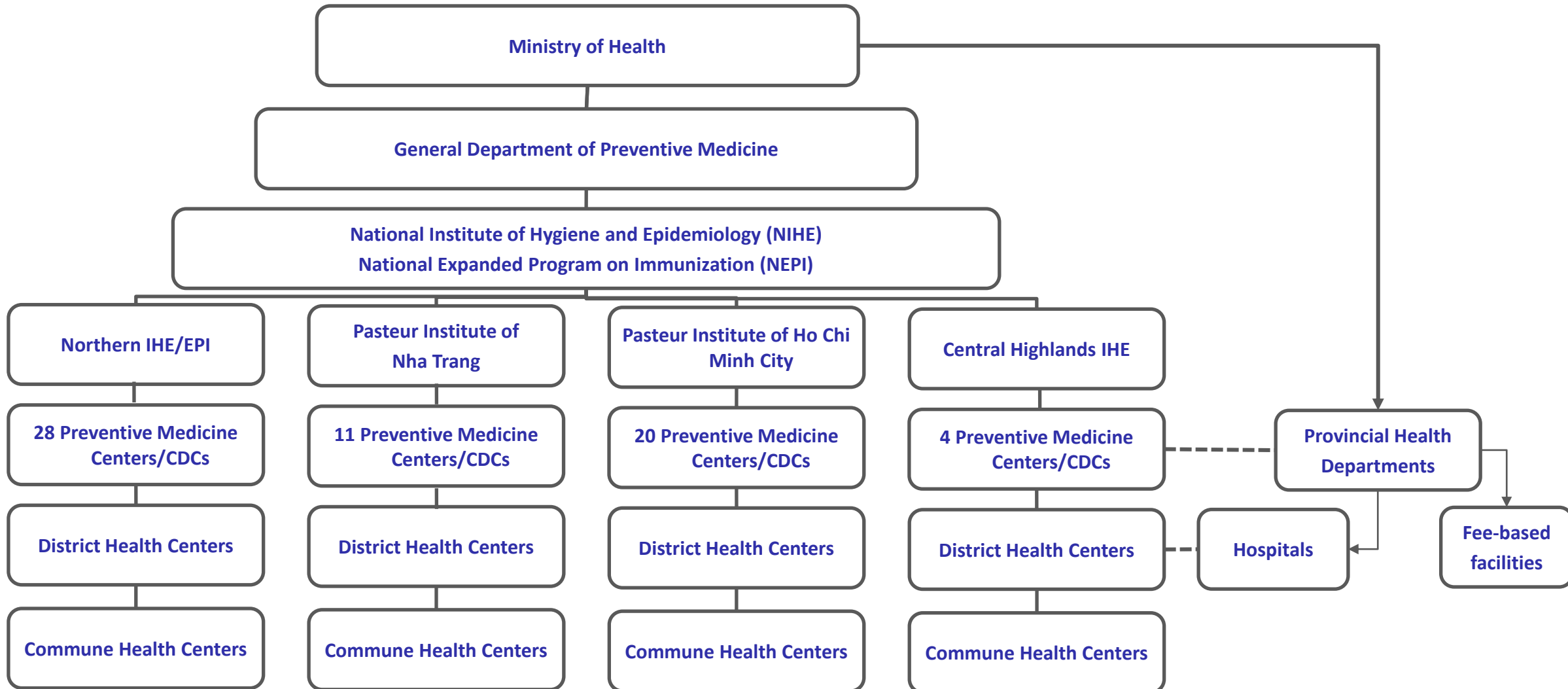
1. Presentation- 15 min
 1. Introducing IDEAL-Vietnam
 2. History and Functions of the NIIS
 3. Design
 4. Development
 5. Deployment
 6. Next steps
2. Interview with National Expanded Program on Immunization and PATH IDEAL colleagues – 15 min
3. Discussion/Q&A – 15 min

National Expanded Program on Immunization in Vietnam

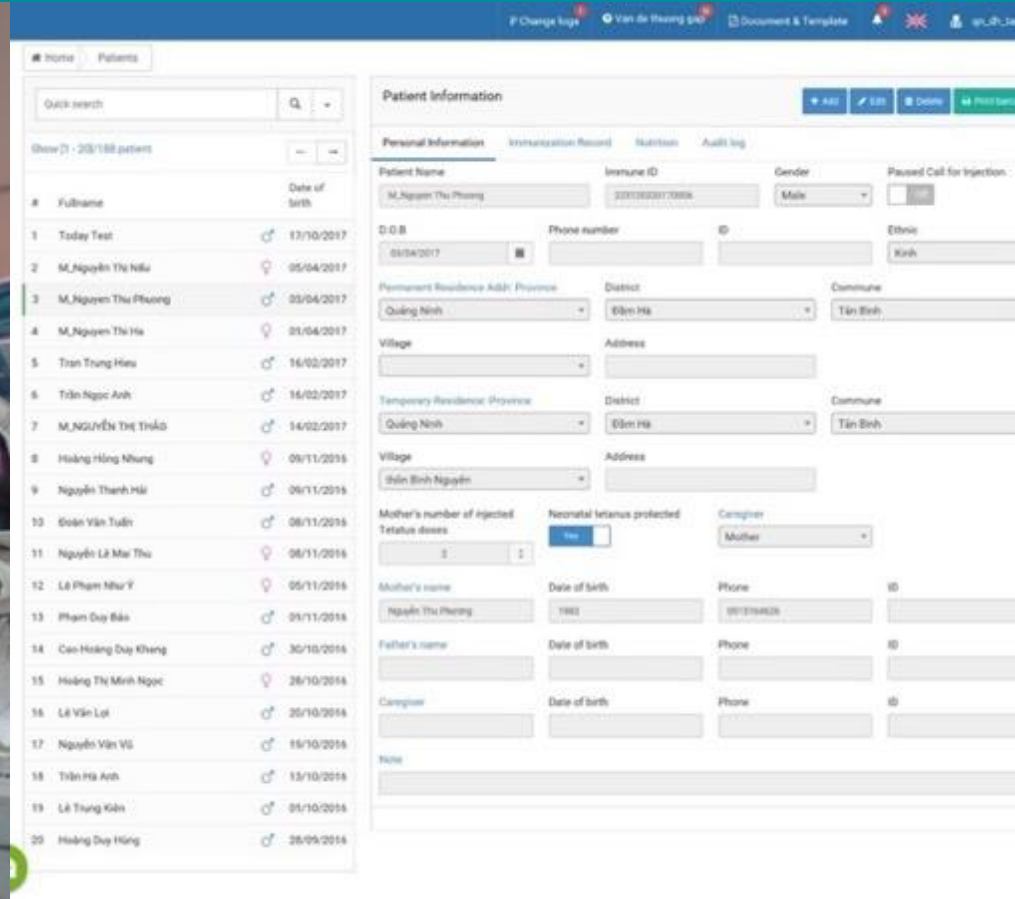
- Annual birth cohort : ~1.7 million.
- Most vaccines are given at commune health centers on monthly immunization days (weekly in some provinces) except for the Hepatitis B birth dose.
- There are geographic inequalities, with lower coverage rates in hard-to-reach areas.
- Before June 2017, immunization information systems were primarily paper-based systems, with some computer-based systems for reporting aggregated data.



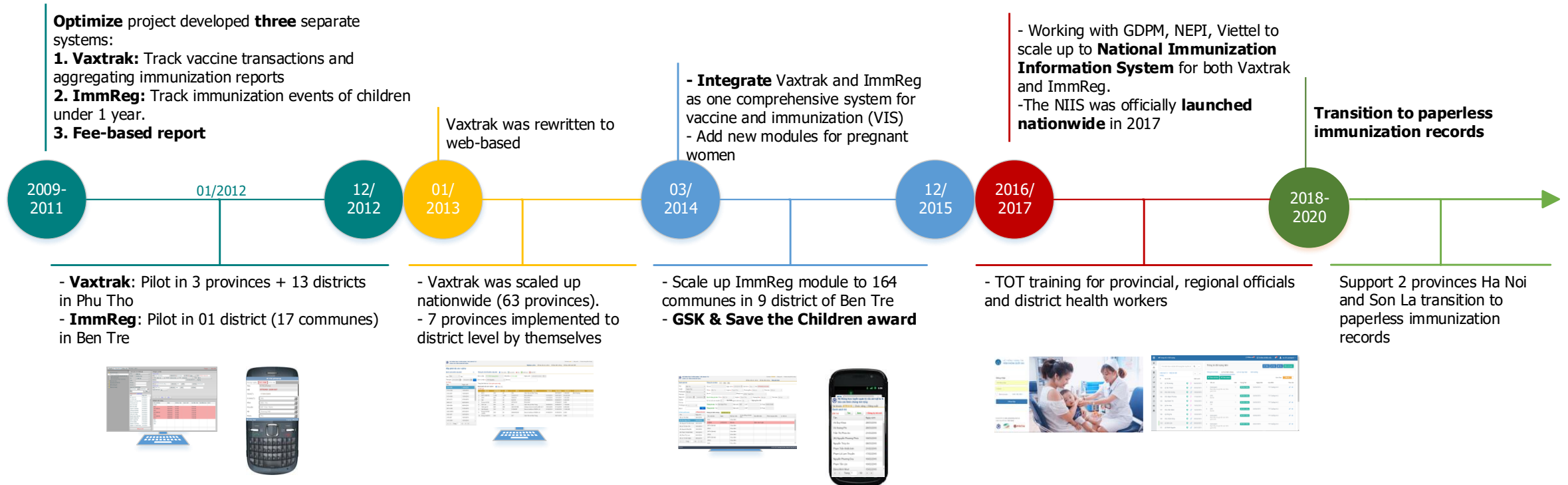
EPI structure in Vietnam



From paper-based records to a national digital database: ImmReg and the National Immunization Information System (NIIS)



From ImmReg and VaxTrak to the National Immunization Information System



Design:

Defining EIR requirements based on end-user priorities and identified problems.

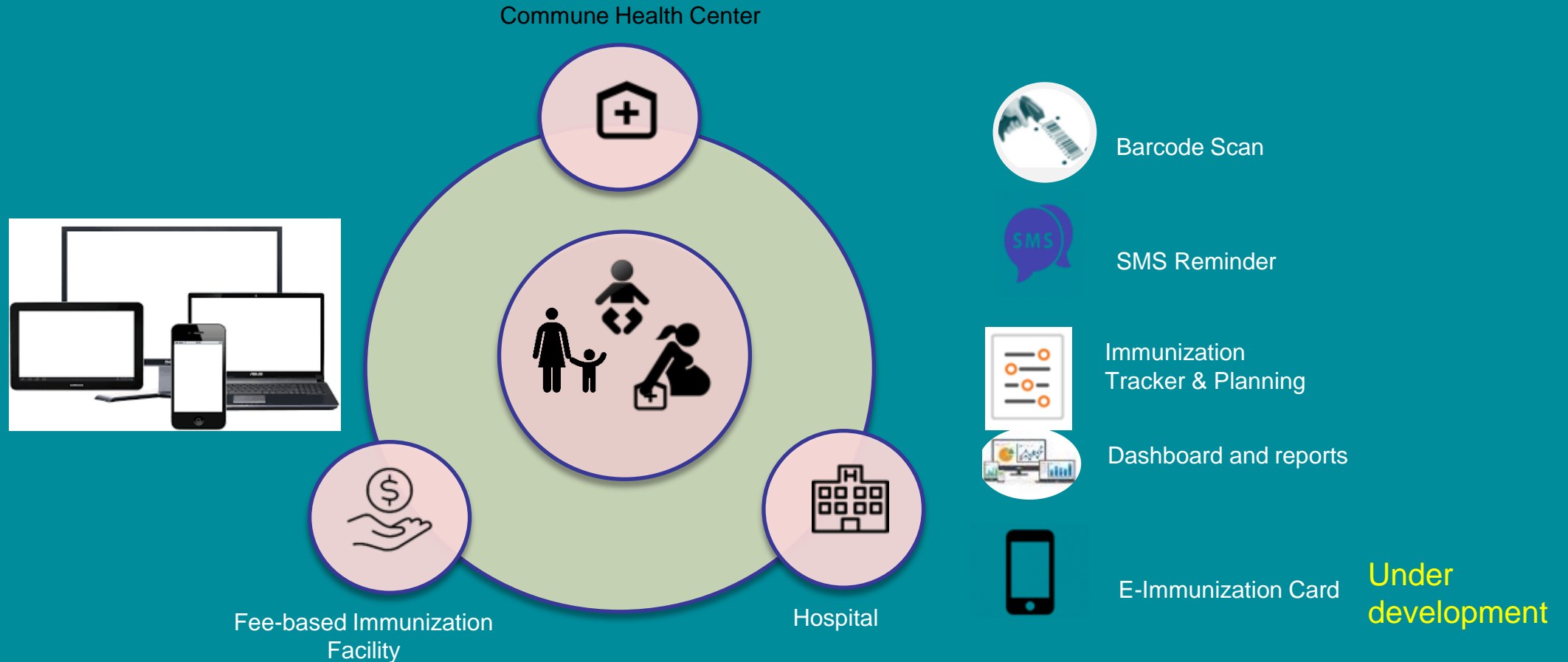
Development:

Creating and testing of EIR software based on predetermined system needs and key functions

Deployment:

Introduction of the EIR system across relevant levels of the health system

System functions: Immunization Registry Module



Introducing **D**igital immunization information systems: **E**xchange **A**nd **L**earning from Vietnam

IDEAL-Vietnam

Goal: To explore and disseminate evidence and lessons learned from Vietnam's implementation of the NIS to support successful implementation of EIRs in other countries.

- By the end of the project, we will have **published and disseminated actionable lessons learned from the Vietnam context** to contribute to the growing body of guidance and evidence emerging, by contributing knowledge gained from a national scale established system in a middle-income country. This will include **implementation guidelines** based on the Vietnam experience, as well as **academic publications** that feature key analyses and collected learnings to inform governments, as well as normative and donor agencies.
- We will encourage awareness and adoption of this information by **publishing our work in a variety of media sources and peer-reviewed publications**, and **diffuse our learnings at conferences and in community forums**.
- We aim to create awareness and understanding of Vietnam's experience to **inform, influence, and accelerate the successful implementation of similar tools at a global scale**.

We also aim to use this project to help the MOH improve the uptake and effective use of the NIS.

Stage 1: EIR Conception, Planning and Design

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1. Conduct landscape assessments that prioritize end-users

- The landscape analysis in Vietnam helped to identify and understand the problem, review policies, and determine current technical capacity and infrastructure
- And provided a snapshot into existing capacity and challenges for implementing an EIR.
- Assessments provided user feedback that helped to design a sustainable system.



Stage 1: EIR Conception, planning and design

2. Establish a project team with clear leadership delegation

- In Vietnam, MOH leadership was supportive and took the initiative for decision-making needed to scale up the EIR.
- Supportive leadership helped to increase end-user commitment
- Forming a TWG helped to communicate between expert groups and work with the system synergistically



Stage 1: EIR Conception, planning and design

3. Perform a costing analysis

- **Cost-modeling for scale-up helps to ensure the sustainability of the project.**
- **The budget needs to include formative research and the development, implementation and maintenance of the system.**
- **A budget should be allocated for continuous improvements, oversight, and system maintenance with clear roles delegated to partners.**



Stage 2: Development of the Software

Stage 2: Development of the Software



1. Define requirements

- Ensuring functional requirements and system requirements helped to identify many critical data-related challenges within the paper-based system that needed to be solved through the development of an EIR.
- These challenges were translated into system requirements to inform the development of the software in Vietnam.

Stage 2: Development of the software

2. Mapping to standard

- **Creating or establishing interoperability standards to govern an exchange between information systems is essential.**
- **Interoperability strategies such as API, should be considered as early as possible during the development of the system.**
- **Government leaders should develop policies to push facilities to connect to the system and exchange data.**



Stage 2: Development of the Software



3. Testing

- The scalability of the system should be considered. It is important to ensure that the EIR can support and sustain a large amount of data that continuously increases.
- Stress tests need to be conducted to anticipate how many clients the system can store without slowing down the system and burdening end users who are using the system online.
- Utilizing lessons learned from previous versions of the system saves time in scale-up and software development

Stage 3: EIR Deployment

Stage 3: EIR Deployment

1. System Rollout

- The pilot system in Vietnam helped to detect bugs in the system early on and understand acceptability from end-users



Stage 3: EIR Deployment

2. Establishing Human Resources

- Human resources need to be under consideration early on because of staff turnover/changes
- Documentation of the system is key so that if leaders who know the system well leave the team, the system can be understood by the replacement staff.
- Allocating human resources from experienced nongovernmental organizations is a good way to save money and develop a well-balanced and experienced working team.



Stage 3: EIR Deployment

3. Training

- Refreshment training is still needed to improve the end-users' knowledge and skills.
- With limited financial resources, e-learning is a useful source of training.



Stage 3: EIR Deployment

4. Implementation Burden

- **Protocols should be developed to recognize duplications between both the paper and digital systems.**
- **Detailed SOPs for the detection of duplications were developed in Vietnam and training was provided for health workers with clear roles and responsibilities for each level of staff.**



Stage 3: EIR Deployment

5. Data Quality and Data Use

- Data quality should be ensured by monitoring and evaluation activities.
- Routine review and data quality checks should be conducted regularly to ensure that all end users are entering the data into the system (on-time, completely and accurately)
- In Vietnam, a readiness assessment helped to assess the data quality and determine the readiness to move to entirely paperless.



Post- Deployment: Sustained Use of the System and the Continuation to Paperless:

As Vietnam continues to move forward to a completely paperless immunization record system, it is important to continue monitoring user feedback and assess the acceptability of the system. The following factors should be continuously analyzed:

1. Resistance to change
2. Workload brought on by new data-entry procedures
3. Necessary time to register a new vaccine recipient into the system
4. Use of reports by different user profiles
5. Low system uptake from fee-based facilities
6. Data quality
7. Duplication due to the lack of unique client ID
8. Interoperability with other systems



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Interview with National Expanded Program on Immunization (NEPI) and PATH



Dr. Dang Thi Thanh Huyen - Vice Head, NEPI Office National Institute of Hygiene and Epidemiology, Vietnam



Mr. Dao Dinh Sang – Program Officer, PATH, Vietnam:

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Any Questions? Comments?



Thank you for your time!

