Implementing an integrated model of Automated Medication Cabinets with Electronic Medication Records

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Background

Automated Medication Cabinets (AMCs) also known as automated dispensing cabinets have existed in health organisations since the late 1980s[1].

AMCs offer an automated decentralized medication management system aimed at improving medication storage and distribution[1]. Some key benefits include timely access and therefore administration of medications, electronic tracking of controlled substances and improved inventory control[1,2].

When incorporated with barcode medication administration scanning technology and integrated with Electronic Medication Record (EMR) they offer an opportunity to introduce a closed loop medication management system and therefore, reduce medication administration errors and potentially improve patient safety[1,3].

Objective

To outline the steps required to implement an integrated AMC/EMR system in a 160 bed Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM) Stage 6 hospital.

Action

The Waterfall project management methodology was used to implement the AMC/EMR integration project. Actions for each step are outlined in Figure 1.

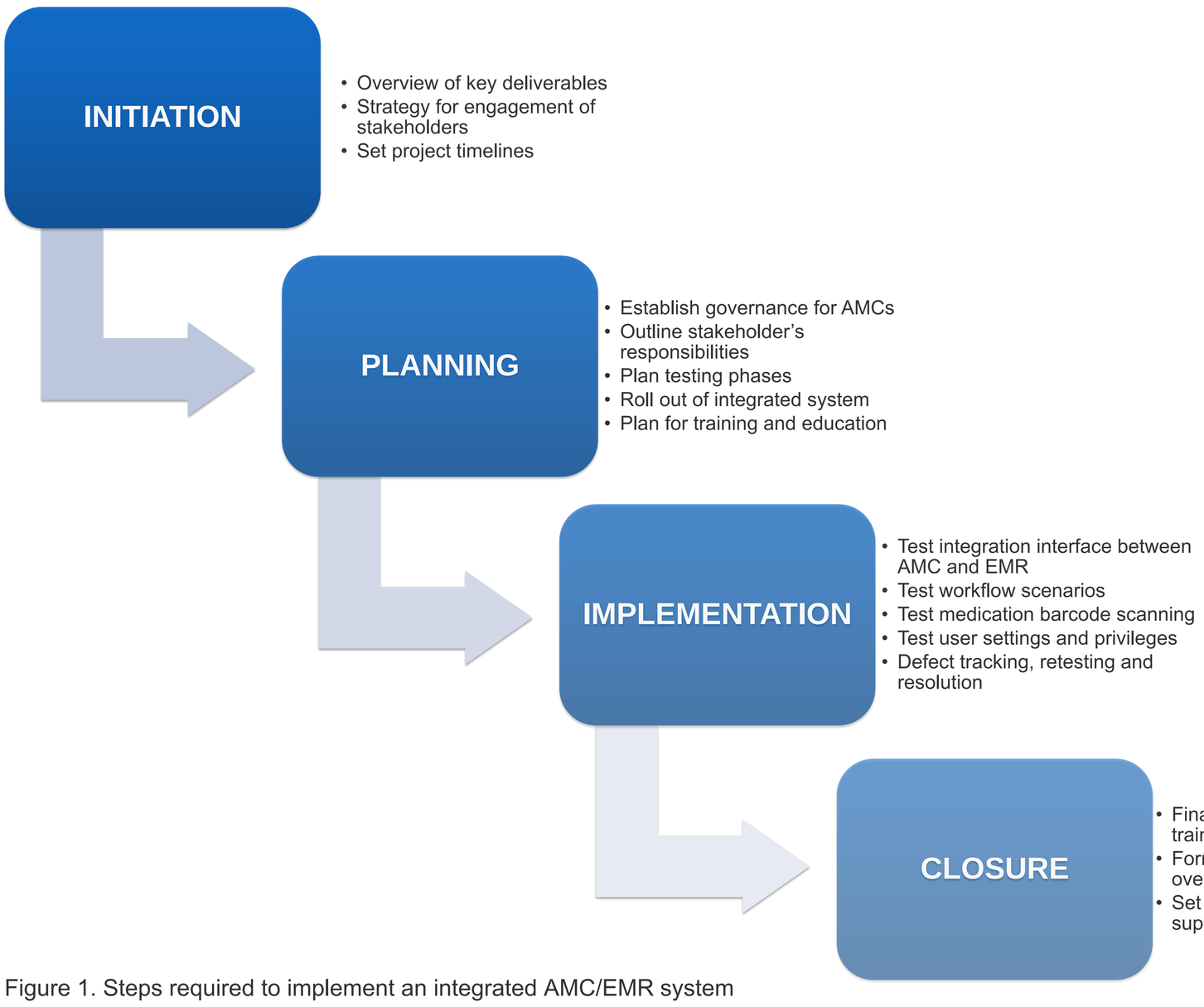

Figure 1. Steps required to implement an integrated AMC/EMR system

Evaluation

The initiation and planning phases of the project were successfully implemented. Many challenges however were experienced during the implementation phase. Some examples of how the issues faced were fixed are included in Table 1.

Issue	Action
• Dosage forms were not recognised as valid solids and liquids due to formulary build and configuration misalignments. • Inability to calculate dose at medication retrieval.	• Hard coding of dosage forms on AMC software. • Matching of dose units in medication order sentences with formulary product build in EMR.
• Inability to queue IV medication infusion order sets as diluents (fluids) are typically not stored in AMCs due to storage limitations.	• Stripping the diluent from the order on the iBUS (integration interface).
• Dose messages from medications in the EMR platform were received as a volume of the diluent rather than the strength of the additive resulting in inability to retrieve the medication.	• Installation of a modified version of the iBUS which processed the message fields differently.

Table 1: Issues and corresponding actions for challenges experienced during the Implementation phase.

Following successful integration of both systems, multiple testing sessions were planned with the nursing staff to demonstrate and modify existing workflows to facilitate usage of the AMCs for medication storage and retrieval.

Finalisation of workflows and the training approach have been determined ahead of the roll out to ensure staff are proficient with the use of AMCs and adequate ongoing support is in place for trouble shooting any arising issues.

Limitations

Although the main strength of the project is to showcase a detailed project plan for integration of AMC/EMR systems, it has limitations. The issues discussed are limited to the brand of AMCs and EMR system to be rolled out. The identified medication build issues are also dependent on how medications are built in each hospital domain.

Conclusion

Four key elements were identified for the successful integration of AMCs with EMR. They included the formation of a steering committee to ensure project milestones were achieved, a robust testing plan, support for technology infrastructure and planning for ongoing user training.

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