

## ADDED VALUE AND FUTURE ADOPTION OF A NEW MEDICAL IMAGING TECHNOLOGY FOR INTERVENTIONAL CARDIOLOGY

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### Background and Objective

Catheter-based minimally invasive techniques for structural heart disease repairs require advanced image guidance, including fluoroscopy and echocardiography. Simultaneous evaluation of these two modalities is challenging. The Philips EchoNavigator integrates real time 3D transesophageal (3DRT TEE) echocardiographic images with fluoroscopy images (Fig 1). This study estimated the potential added value of ultrasound-fluoroscopy fusion technology, to support the product development and marketing positioning of the technology in interventional cardiology.

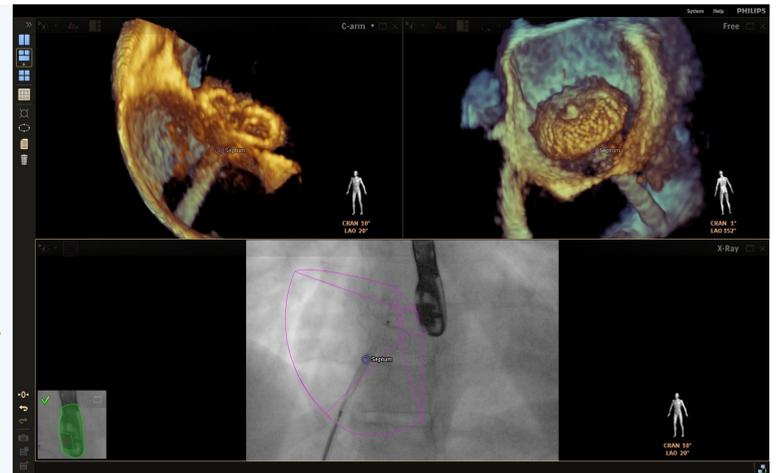


Fig 1. EchoNavigator view planes in atrial septal defect (ASD) closure. Top: 2 3DRT TEE images. Below: fluoroscopy image with TEE probe.

### Materials and Methods

1. Stakeholder analysis: Identify professionals involved in the adoption process.
2. Literature review: Identify cardiac interventions that may benefit most from the ultrasound-fluoroscopy fusion technology.
3. Workflow resource use analysis: Comparing standard care with the EchoNavigator workflow.
4. Analytic Hierarchy Process: Weight stakeholder's decision criteria based of interviews to adopt the new imaging technology.
5. Value based pricing: Estimate the potential added value of EchoNavigator to specific types of hospitals based on volumes.

### Results

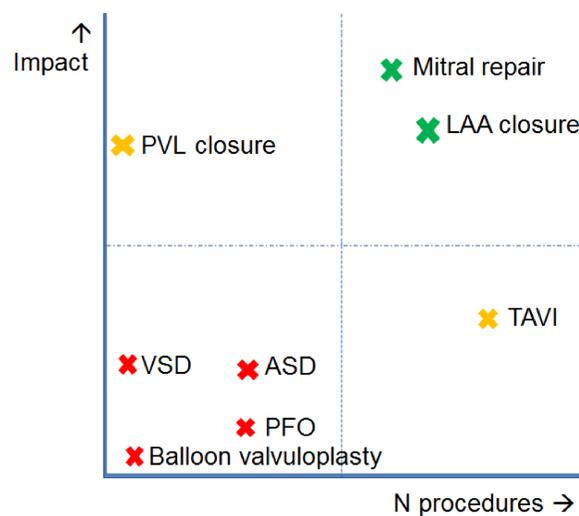


Fig 2. Results from literature search on cardiac interventions which benefit from EchoNavigator PVL: para valvular leak; LAA: left atrial appendage; VSD: Ventral septal defect; ASD: Atrial septal defect; PFO: Patent foramen ovale; TAVI: trans catheter aortic valve implantation

1. Interventional cardiologists are key stakeholders in technology adoption process.
2. Mitral repair and LAA closures are good candidates for technology adoption: high volume and high impact (Fig. 2).
3. Workflow analysis shows mitral repair could benefit most from the new technology, as it facilitates communication between interventional cardiologists and imaging professionals

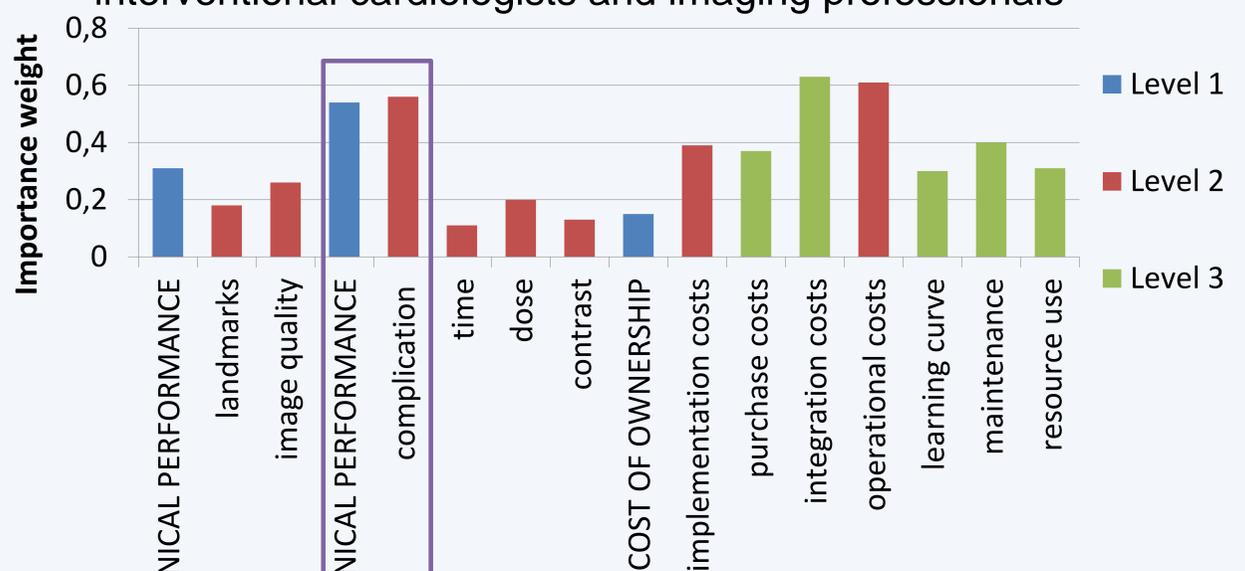


Fig 3. Importance weights for AHP criteria, consistency index = 0.3

4. AHP(n=22): reduction in complication rate is the most important adoption criterion (Fig 3).
5. Cost savings result mainly from improved procedural success (Fig 4) Centers of expertise with medium to high procedure volumes expected to experience the biggest advantage.

Fig 4. Cost for Mitral repair using Echonavigator. Red: set-up and interacting time with EchoNavigator, Green: time reduction, Purple: complication rate reduction and Blue: procedural success.



### Conclusion

The ultrasound-fluoroscopy fusion technology can provide added value in specific cardiac interventions, especially in hospitals with medium to high procedure volumes. Early assessment of potential added value and adoption criteria timely and effectively supported the product development phase. It informed various decision makers on the factors influencing the expected value of and uncertainties surrounding a future adoption of the technology.