Software as a Medical Device (SaMD)

Working Group Status
Application of Clinical Evaluation

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NWIE Proposal - Software as a Medical Device (SaMD): Clinical Evaluation

Purpose: To give detailed guidance on when clinical data may be needed for an original SaMD and for a modification to a SaMD based on the risk classification for SaMD (SaMD N12) adopted by IMDRF to support market authorization.

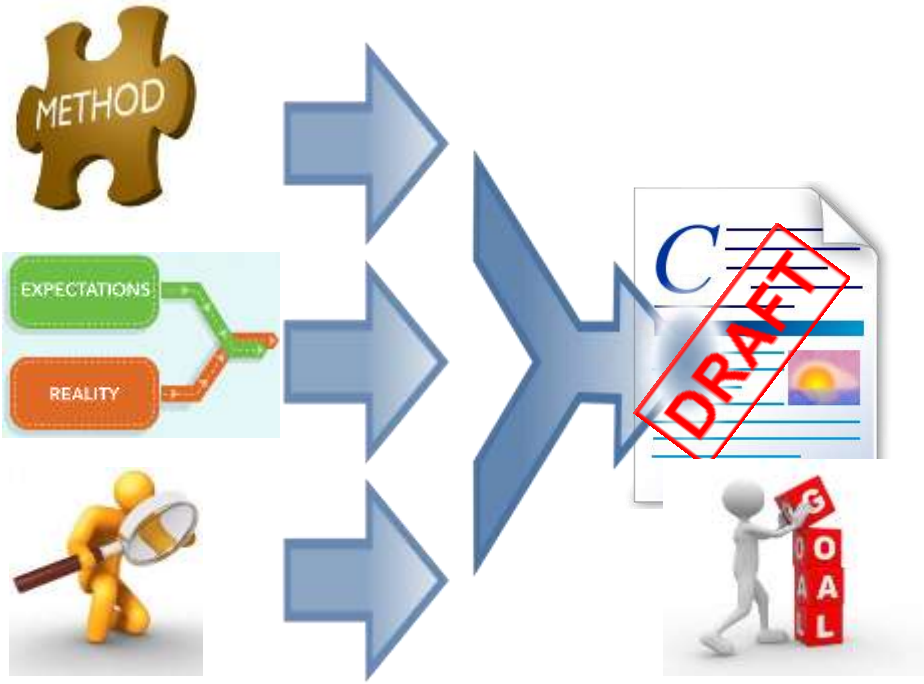
Rationale: Though current clinical guidance are intended to be relevant across a broad spectrum of technology, SaMD operates in a complex socio-technical environment heavily influenced the inherent nature of software that enables a highly interactive and iterative technological environment. A majority of the respondents (from the IMDRF survey) either believe current clinical guidance needs to be revised with criteria specific for SaMD, or don't know whether it applies to SaMD.

Alignment with goals/objectives: A common understanding on the application of clinical evaluation and clinical evidence processes and the need for clinical data to support market authorization will lead to increased transparency and promoting a converged thinking on this topic.

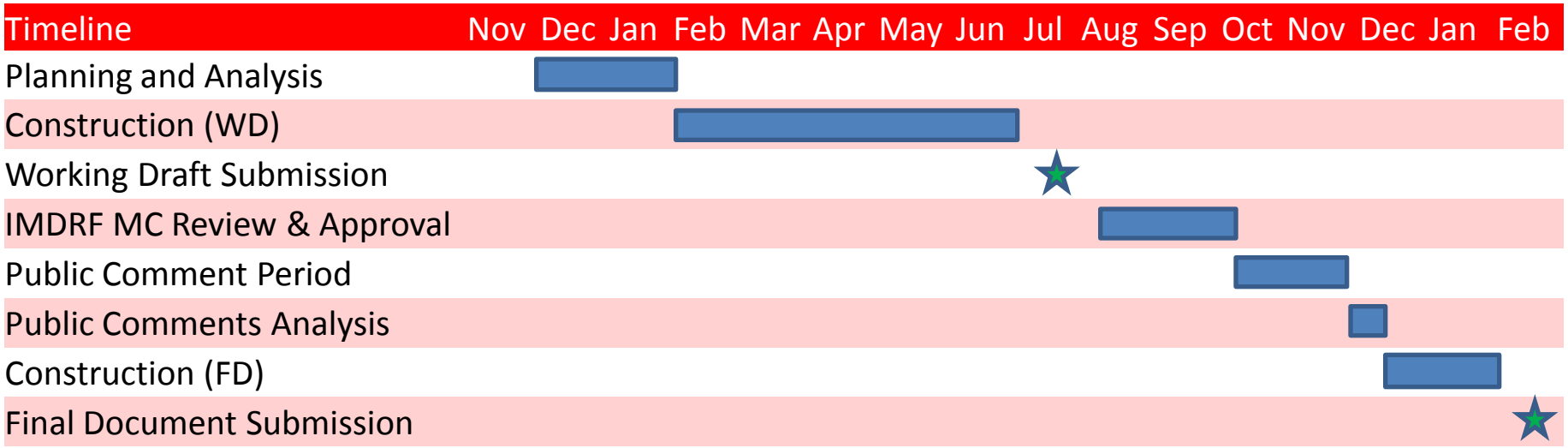
Goal

International Guidance -- Based on "SaMD type" (level of impact on public health) and unique aspects of software

- Which clinical evaluation methods and processes should/can be appropriately used for SaMD to generate evidence of clinical effectiveness?
- How much and what level of evidence is adequate to show clinical effectiveness?
- Which SaMD types are important /not important to independently verify
  - Clinical evidence
  - Adherence to methods and processes



Draft Timeline & General Work Plan



Planning and Analysis

- Complete landscape of current state (GHTF, MEDDDEV, FDA Guidances, etc.)
- Analyze existing regulations, guidance, etc. and their applicability to SaMD (terminology, when CE needed, what needed, etc.)
- Define Scope
- Define strategic direction of the document (how to structure, target audience, etc.)

Construction (WD)

- Feb – in person meeting, complete preliminary working draft for sharing with key stakeholders for early input
- Mar / April – gather key stakeholder input
- May / June – complete working draft
- July – submit WD to IMDRF MC
- Aug / Sept – IMDRF MC review & approval
- Oct / Nov – public commenting period (60 days)

Construction (FD)

- Dec – analyze public comments
- Jan – in person meeting, resolve comments and draft final document
- Feb – submit FD to IMDRF MC (date to be finalized once IMDRF 2016 meetings confirmed)

Current Status

- Working group formed (21 members listed on *website)*
  - Regulators, academia, and high tech industry

- First face to face WG meeting held (Washington D.C Feb 16-19)

Meeting Objectives February 16-19, 2016

A common understanding and agreement on

1. Existing clinical evaluation methods and practices and the challenges in applying them to SaMD
2. Scope and high level content to include in the document
3. Methods, practices and evidence appropriate to the uniqueness of SaMD

Objectives by Day

Day 1

Challenges

- *Context of current work with other SaMD work products*
- *Understanding challenges and needs raised due to unique aspects for SaMD*
- *Understand the focus and scope of this document*

Common understanding of clinical evaluation challenges for SaMD

Day 2

Methods

- *Understanding existing (MD/IVD) methods and processes*
- *Assessing applicability of current methods to address challenges and needs*
- *Tailoring and exploring methods that are appropriate for SaMD*

Common understanding of clinical evaluation methods applicable to SaMD

Day 3

Evidence

- *Understanding current (MD/IVD) level of evidence requirement*
- *Understanding the appropriate level needed for SaMD – that is maintained over the lifecycle*
- *Tailoring methods and evidence for different SaMD types*

Common understanding that evidence generation is proportional to SaMD types (risk)

Day 4

Next Steps

- *Review document structure*
- *Review key points to be captured in the document*
- *Planning next steps towards a draft document*

Common understanding of document structure and next steps for draft document

Relationship to previous documents

	SaMD mfg 1	SaMD mfg 2	SaMD mfg 3	SaMD mfg ..	SaMD mfg ..	SaMD mfg n
Type I	X		X	X		
Type II		X		X		
Type III	X		X			X
Type IV				X	X	

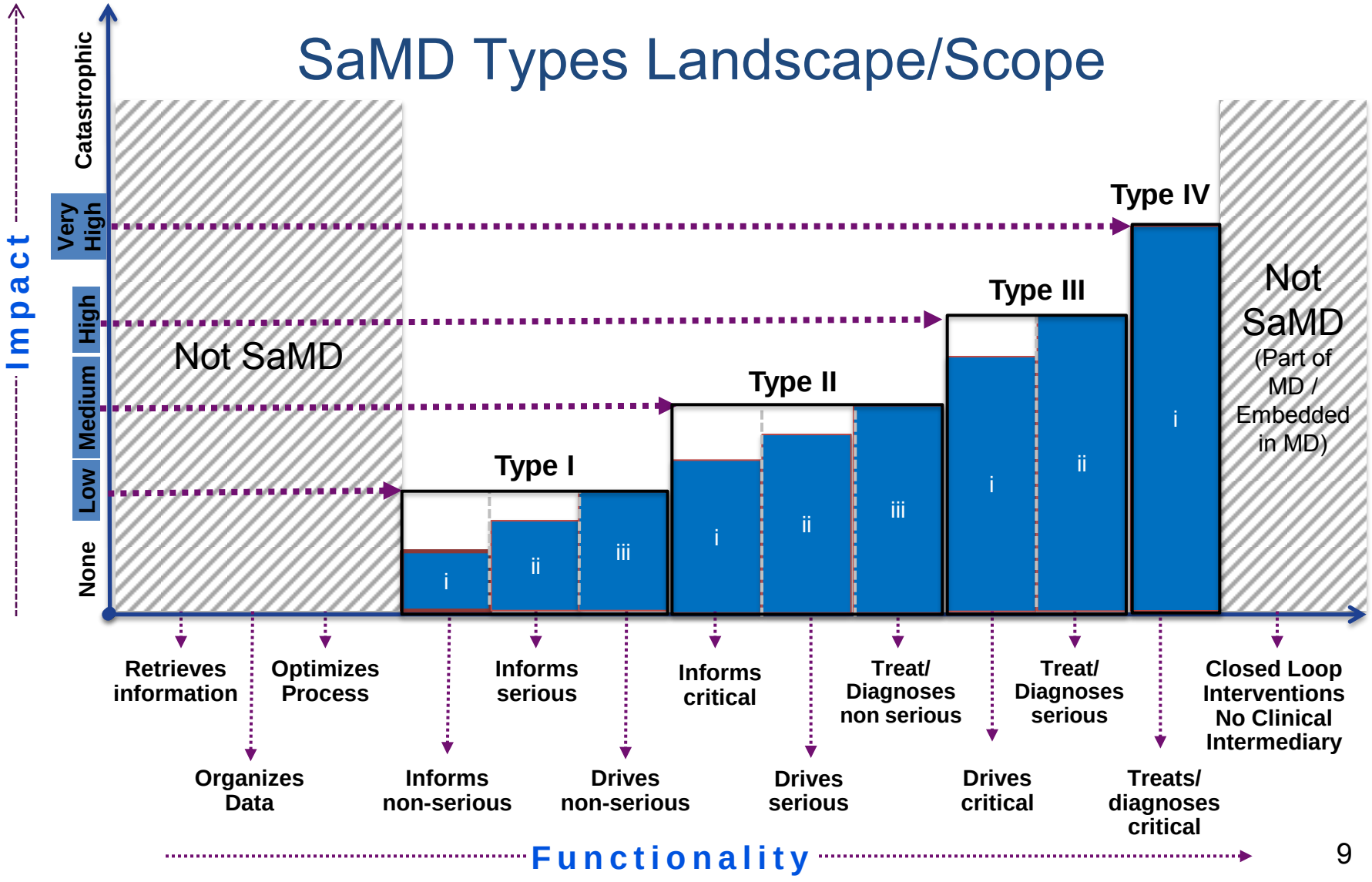
Common SaMD Type specific expectations: (**Based on Patient impact**
- when and which methods and processes are important to independently verify?
- How much / what type evidence is adequate to verify?)

- QMS Process
- Risk management
- Engineering validation
- Clinical evaluation and evidence

Common SaMD manufacturer expectations (methods and processes that each mfg should have **regardless of type of SaMD made**) :
- N12- identification of SaMD in risk framework
- N23- Quality management system – 13485
- Risk management system – ISO I4971
- Process for evaluation of safety, effectiveness and performance, including clinical evaluation

New work item:
Software as a Medical Device (SaMD): Clinical Evaluation

SaMD Types Landscape/Scope



Key Assumptions for Work Item

- All manufacturers of SaMD follow adequate quality management systems
- Quality Management Systems ensures
  - Rigor in generating evidence towards
    - *Usability*
    - *Quality – (conformance to specifications, "fitness for use" and free from defects)*
    - *Reliability*
  - Service and Continuous Improvement - Ability to maintain quality while in use.
- SaMD quality validation is covered as part of QMS
- Except in small cases almost all SaMD generate information for use and reliance
- All SaMD require some clinical evaluation method to assure effectiveness and clinical benefit
- Clinical evaluation scope is dependent on "intended use" as defined by the manufacturer of SaMD

SaMD Challenges Background

Sweden WG

- What clinical guidelines should I consider (metrics)
- Which of those exist today / which don't (what do I contribute now)
- Whose guidelines do I use
- What form of evidence do I need (bench test, lab test, ……)
- Who can help me do it
- How do I determine if I pass/fail (success criteria)
- How do I document
- How should the clinical evidence be maintained over time

2015 Survey

- Confusion around privacy & security and data protection and how it relates to CE.
- SaMD don't have direct impact to patients so shouldn't need CE
- CE for SaMD that cut across multiple (all) SaMD types, i.e. tools that measure aspects of a physiological signal (X-ray, ECG, images, etc.)
- CE for SaMD that are frequently updated
- Difficult to find clinical performance information in literature or journal articles
- Risk of drawing clinical conclusions based on biased or limited data set.
- Cyber security requirements for clinical studies; proving SaMD safety for use in clinical studies per ISO 14155.
- CE for products that are partially configured by users (clinicians, patients, caregivers, etc.)
- Limited clinical literature available for many SaMD products; novel correlations, or clinical applications, where gold standards don't exist.

Challenges – WG Summary

- Current GHTF / Regulatory does not easily translate to new entrants (SaMD Manufacturer)
- SaMD changes constantly -> sw is learning – not static as MD/IVD
- Relationship between QMS validation and clinical evaluation is unclear
- SaMD can use any inputs and it is hard to control in clinical evaluation – as typically expected in MD/IVD
- SaMD enables Novel outcomes that do not necessarily have Gold Standards
- Clinical evaluation current expectations time frame – misalignment with development cycle themes for SaMD
- Reuse of predicate clinical evidence (same or different manufacturer) is unclear
- Disparate vocabulary on what is considered clinical evaluation
- Too many confounding factors during implementation, i.e., risk management, change, clinical evaluation, technical validation, etc.

Desired State – WG summary

- Promote an Agile / learning clinical evaluation framework
- For continuously changing SaMD – need:
  - Ability to update Clinical Evidence continuously
  - Leverage the capability of learning new evidence
  - Allow self-learning
- Allow postmarket continuous evaluation paradigm
- Promote technology capabilities to facilitate collecting & learning clinical evidence
- Allow SaMD outcomes to evolve in claims and functionality as postmarket evidence is being collected.
- Pre-market clinical evidence may be different for SaMD, requiring methods that allow postmarket collection

Next steps

- Identify key themes to be included in the document
- Revise document structure
- Create working draft for WG review
- Finalize “Proposed document” for management committee consideration prior to public consultation

Thank You