Agile Hardware and Systems Process Proposal

Will Bishop

6 May 2016

Roche Diabetes Care, Indianapolis Meter Development

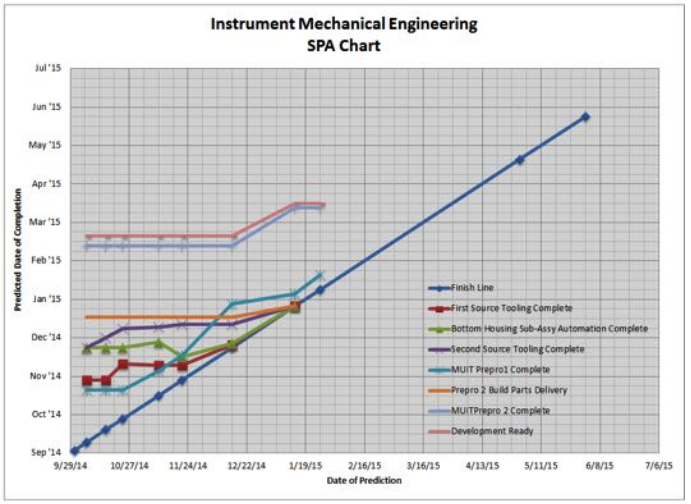
Agile Hardware and Systems Proposal

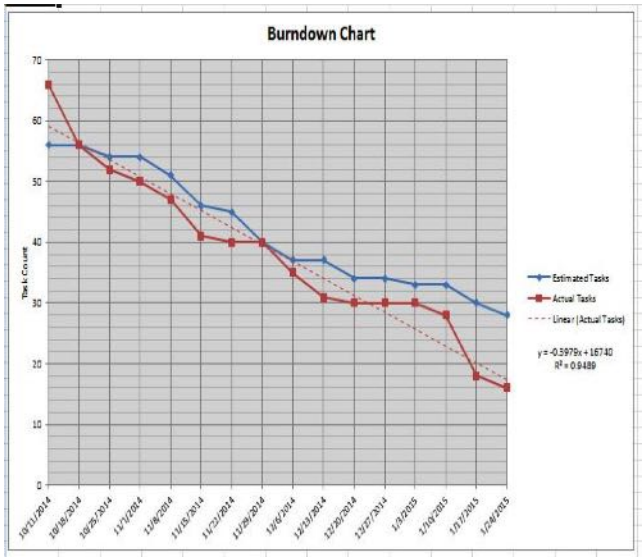
	D	E	F	G	H	I
1	Task	Milestone Impacted	Program Dec Dat	Completion Date	Completion Date	Assign To
2	~~Create fixture for measuring hooks on Bottom Housing (X sections: B, E, & F)~~	~~First Source Tooling~~	-	-	~~10/9/2014~~	~~Akhil~~
3	Research quality parameters around laser marking	N/A	12/9/2014			Akhil
4	Create TIR for Tolerance Analyses	Gate 2 Ready	12/9/2014			Akhil
5	TIR/MUIT Report for DM4 Mechanical Drop-Shock-Vibe Testing & Tear-Downs	First Source Tooling	11/9/2014			Akhil
6	~~Create go/no-go fixture for Cam Link~~	~~First Source Tooling~~	-	-	~~10/10/2014~~	~~Akhil~~
7	~~Update colors on Lens and Buttons drawings (standard & Japan)~~	~~First Source Tooling~~	-	-	~~10/10/2014~~	~~Caleb~~
8	~~Update artwork files for Lens, Battery Door, Bottom Housing Sub-Assy, & Buttons~~	~~Gate 3 Ready~~			~~9/29/2014~~	~~Caleb~~
9	Blue Folder for artwork files	Gate 2 Ready	12/3/2014	11/24/2014		Akhil
10	Determine optimum extreme temp cycling timing	BI MUIT				Akhil
11	Copy regulatory symbols to MEGroup\Labeling folder	N/A				Akhil
12	Create Geneva MS MUIT Protocol – First Article Inspection & Capability Studies	BI MUIT	10/10/2014	10/10/2014		Caleb
13	Create Geneva MS MUIT Protocol – Material Certification	BI MUIT	10/10/2014	10/10/2014		Caleb
14	~~Create Geneva MS MUIT Protocol – Button Actuation & Maximum Allowable Force~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Akhil~~
15	~~Create protocol for TIR – Geneva MS MUIT Battery Door Installation & Removal Force~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Jamod~~
16	~~Create protocol for TIR – Geneva MS MUIT Screw Torque Seat &~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Jamod~~
17	~~Create protocol for TIR – Geneva MS MUIT Lens Retention~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Akhil~~
18	~~Create protocol for TIR – Geneva MS MUIT Lens & Laser Marking Abrasion~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Akhil~~
19	~~Create protocol for TIR – Geneva MS MUIT Battery Insertion &~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Jamod~~
20	~~Create protocol for TIR – Geneva MS MUIT Mas Check Strip Force~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Akhil~~
21	~~Create protocol for TIR – Geneva MS MUIT Various Battery Sizes~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Akhil~~
22	Create Geneva MS MUIT Protocol – Robustness Thermal Cycle	BI MUIT	10/10/2014	10/10/2014		Caleb
23	~~Create Geneva MS MUIT Protocol – Robustness Battery Door Insertion Cycle Testing~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Caleb~~
24	Create Geneva MS MUIT Protocol – Robustness Button Cycle	BI MUIT	10/10/2014	10/10/2014		Akhil
25	~~Create Geneva MS MUIT Protocol – Observations~~	~~BI MUIT~~	~~10/10/2014~~	~~10/10/2014~~	~~10/15/2014~~	~~Caleb~~
26	CN updates ID Spec document for colors (standard and Japan)	Gate 2 Ready	12/9/2014			Akhil
27	Create protocols for Strip Connector MUIT Plan	BI MUIT	10/15/2014			Caleb
28	CN updates for MUIT Plan	BI MUIT	3/2/2014			Caleb
29	Draft memo to Project Records for BI tooling validations	BI MUIT	11/9/2014			Caleb
30	PPAP approval of Negative Battery Contact	First Source Tooling	11/9/2014			Supplier
31	SCR approval of Supplier parts	First Source Tooling	11/9/2014			Supplier
32	~~Retesture Battery Door tool~~	~~First Source Tooling~~	-	~~10/24/2014~~	~~11/5/2014~~	~~Supplier~~
33	Battery Door tool validation	First Source Tooling	11/21/2014	11/21/2014		Supplier
34	BI Completion Report	BI MUIT	11/17/2014	11/14/2014		Caleb
35	Bottom Housing tool validation	First Source Tooling	10/31/2014	10/31/2014		Caleb
36	~~Bottom Housing Sub-Assembly Automation FAT~~	~~BM Sub-Assy Automation~~	-	~~10/23/2014~~	~~10/27/2014~~	~~Supplier~~
37	~~Bottom Housing Sub-Assembly Automation Site Install~~	~~BM Sub-Assy Automation~~	-	~~11/10/2014~~	~~10/31/2014~~	~~Supplier~~
38	Bottom Housing Sub-Assembly Automation SAT	BM Sub-Assy Automation	-	11/17/2014		Supplier

Task Tracking List

Example Information flow:

Sprint Task Tracking to Burndown and to SPA





Top-Level SPA Chart

Prochain Input

Agile Hardware and Systems Proposal

Functions and Project Schedule

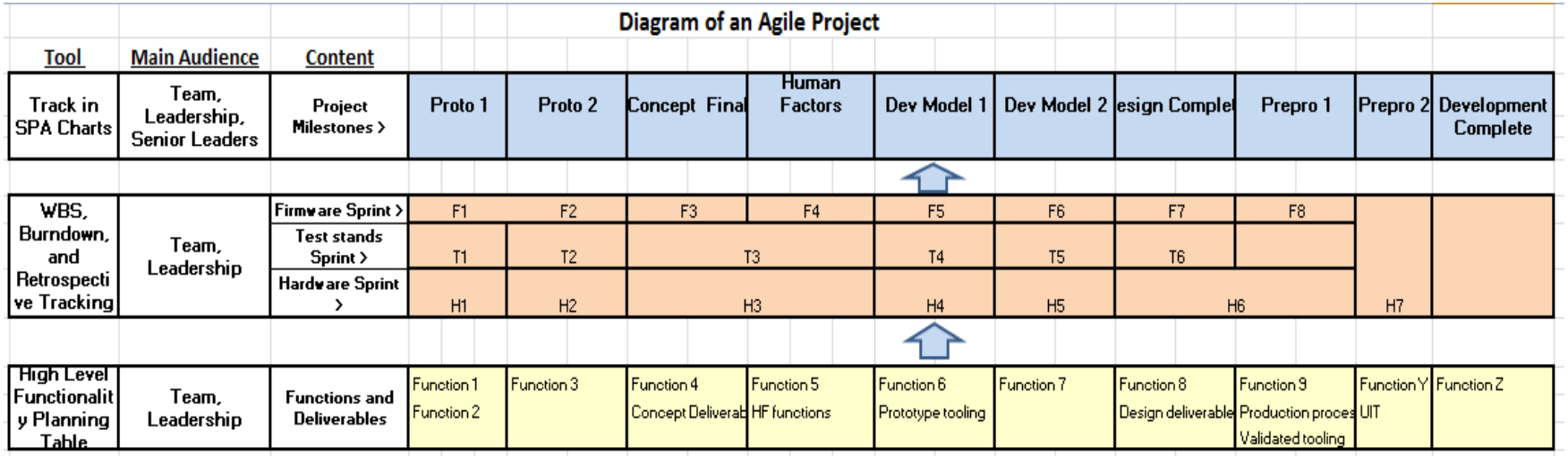
Hardware Agile aligns with other Agile efforts for a Systems Agile approach

- HW, FW, and other sprints align to support builds, events and milestones
- Data from E.V. task tracking and burndowns for schedule and budget for each function is summarized in project level information including SPA charts

Project Milestones
^
Functional Milestones
^
Detailed WBS Tasks

Agile Hardware and Systems Proposal

Functions and Project Schedule



Agile Hardware and Systems Proposal

Agile Tools currently in development or use for hardware are:

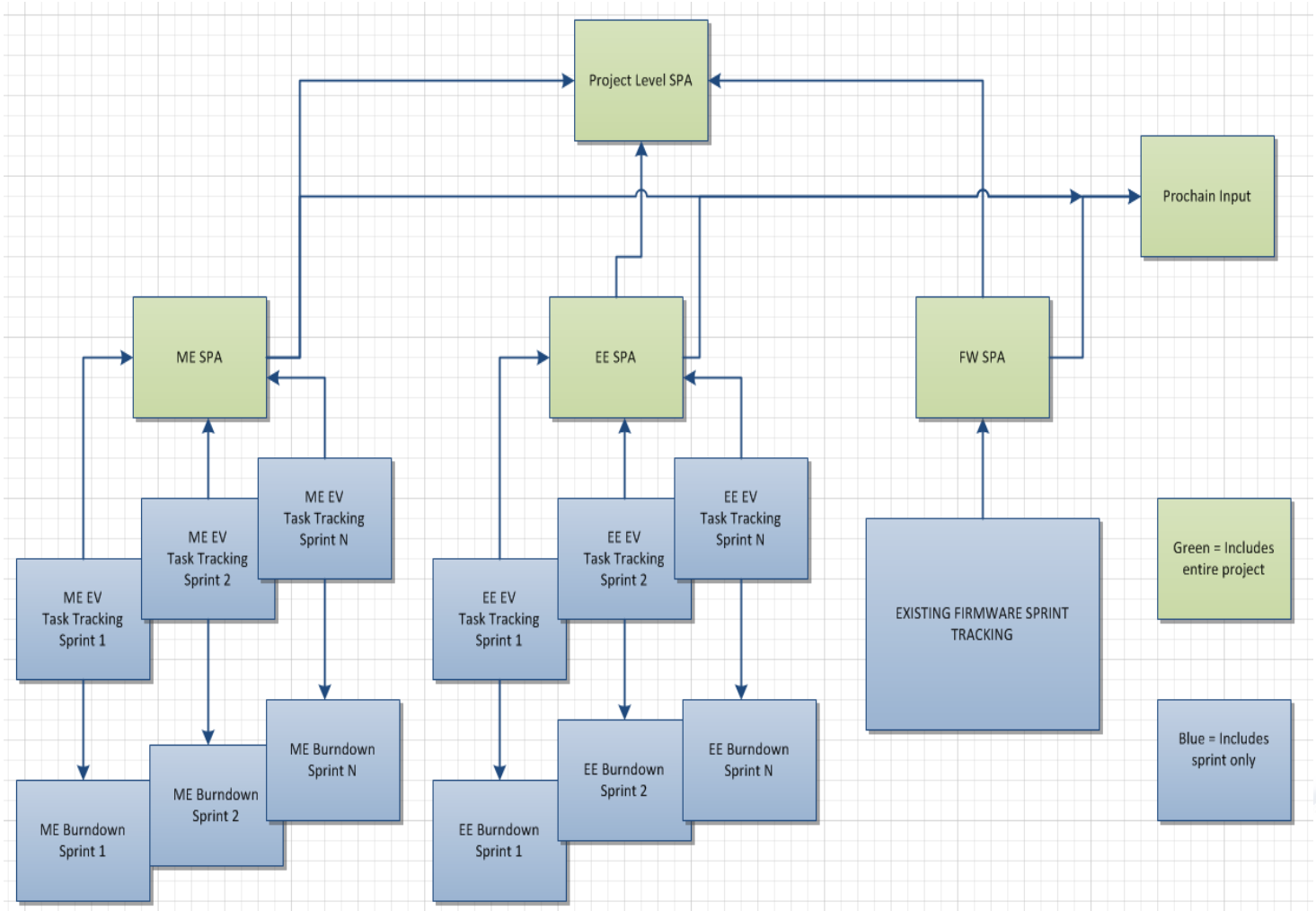
- Task lists/Work Breakdown Structures
- Sprints and Burndown charts
- Schedule Prediction Accuracy (SPA) Charts

How does hardware Agile relate to software/firmware Agile and Agile in general?

- In our process, hardware sprints do not have a fixed length; the recommendation is to have a firm functional or milestone goal for the hardware sprint, such preparation for an upcoming build. The end date of the sprint floats with the completion of that goal.
- Hardware sprints are normally longer than software sprints

Agile Hardware and Systems Proposal

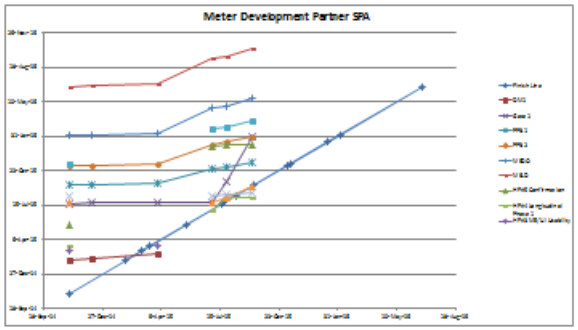
The tracking efforts for all functions can be aligned in to an Agile project structure



Agile Hardware and Systems Proposal

Example Elements of an Agile Project - Outsourced

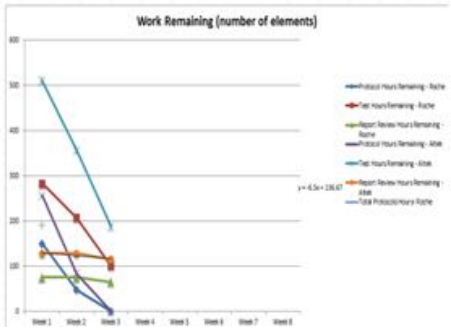
EE Tracking with EV
—Internal and UIT



External Partner Functional SPA

For an outsourced project, how to track inside vs. outside work?

- For inside and outside UIT, keep detailed EV Task Tracking/Burndown
- Other tasks: Have partner report functional SPA details, which will feed into reporting structure. Plus other reports from their system



EE Burndown of EV
—Internal and UIT

EE SPA - Combined

ProChain

Project SPA

EV = Earned Value

Agile Hardware and Systems Proposal

Future enhancements:

- Show WBS structure containing multiple sprints, and backlog items moving with EV from sprint N to sprint N+1
- Show flow of EV from WBS to functional summary to project, in Excel format across project and time

Agile Hardware and Systems Proposal

References:

- www.tcgen.com : http://tcgen.com/agile-software-hardware-part-3/#.Vk3s0KQo57g
- Scrum in Mechanical Product Development: Thesis ÞÓRDÍS REYNISDÓTTIR, Chalmers University of Technology, Gothenburg, Sweden, 2013

Thank You