	...
Online team meeting	https://fau.zoom.us/j/67882200480?pwd=SFZEcmhWbVJFM3VHK2ErVmdzVWdvZz09
Production system (if any)	...
Test system (if any)	...
GitHub repository	https://github.com/amosproj/amos2022ss01-firmware-downloader
GitHub kanban board (project)	https://github.com/amosproj/amos2022ss01-firmware-downloader/projects/1
Team T-shirt (white)	https://www.shirtinator.de/en/loadBasket/hriPWRy39Qc
Team T-shirt (black)	https://www.shirtinator.de/en/loadBasket/ziDwG0qolz7
Additional materials	https://drive.google.com/drive/folders/1CuSPsDVs2Uylrpx1031sULPWs9QJqpzD?usp=sharing

Last Name	First Name	GitHub User Name	Email Address
Hellmich	Andreas	FendVario1	andreas.hellmich@fau.de
Schels	Florian	FloSchels	florian.schels@fau.de
PALA	TEJESH	TejeshPala	tejesh.pala@fau.de
May	Maximilian	elgustov	
Kothapalli	Uday Varun	udayvarun	uday.varun.kothapalli@fau.de
Magsi	Tariq Hussain	tariqmagsi	tariqmagsi125@gmail.com
Asghar	Ali	AliAsghar01	alan.asgharawan@gmail.com
Arif	Muhammad Fazeel	ariffazeel99	arif.fazeel99@gmail.com
Aziz	Bilal Asghar	bilalasgharaziz	bilalasgharaziz@gmail.com

Goals	Sucessfully using the scrum framework to create a software that is complete, has no bugs, doesn't break and fulfills all given requirements.		Signature
Meeting norms	Wednesay meeting is mandatory for everyone, other sperate meetings for the people involved (may vary). Being on time is mandatory. Delays or no-shows (e. g. sickness) have to be announced ASAP, at least before the start of the meeting. Teammeeting should be structured and held according to SCRUM. Actual work has to be done during the sprint and/or in separate meetings.		Florian Schels
Working norms	critisism only on professional level; try to solve issue directly, if not possible contact the SM, if still no solution make it part of the team meeting		Maximilian May
			Andreas Hellmich
Coordination norms	Agree with FS and AM. POs responsible for technical coordination, SM responsible for ideal implementation of SCRUM Framework and team issues. Ideally SM involvement declines over time. If Meeting is requested by SD to solve misunderstandings they should select the Meeting leader		
Communication norms	Informal communication via Whatsapp. Technical communication via Slack. Respond within 24h max (and if it's just "i'll look into it at x"); Communicate illness/delays once noticed; If anything is not clear, communicate that immediately.		
Consideration norms	no side conversations during meetings		Tejesh Pala
Cont. improvement norms	team progress is tracked using project board. Impediments backlog is discussed in team meeting.		Uday Varun Kothapalli
Rewards	If sprints are successful, no additional meetings are neccessary ;)		Tariq Hussain Magsi
Sanctions	No Sanctions for now - might be added later"		Fazeel Arif
			Ali Asghar
			Bilal Asghar Aziz
https://oss.cs.fau.de/teaching/cour			

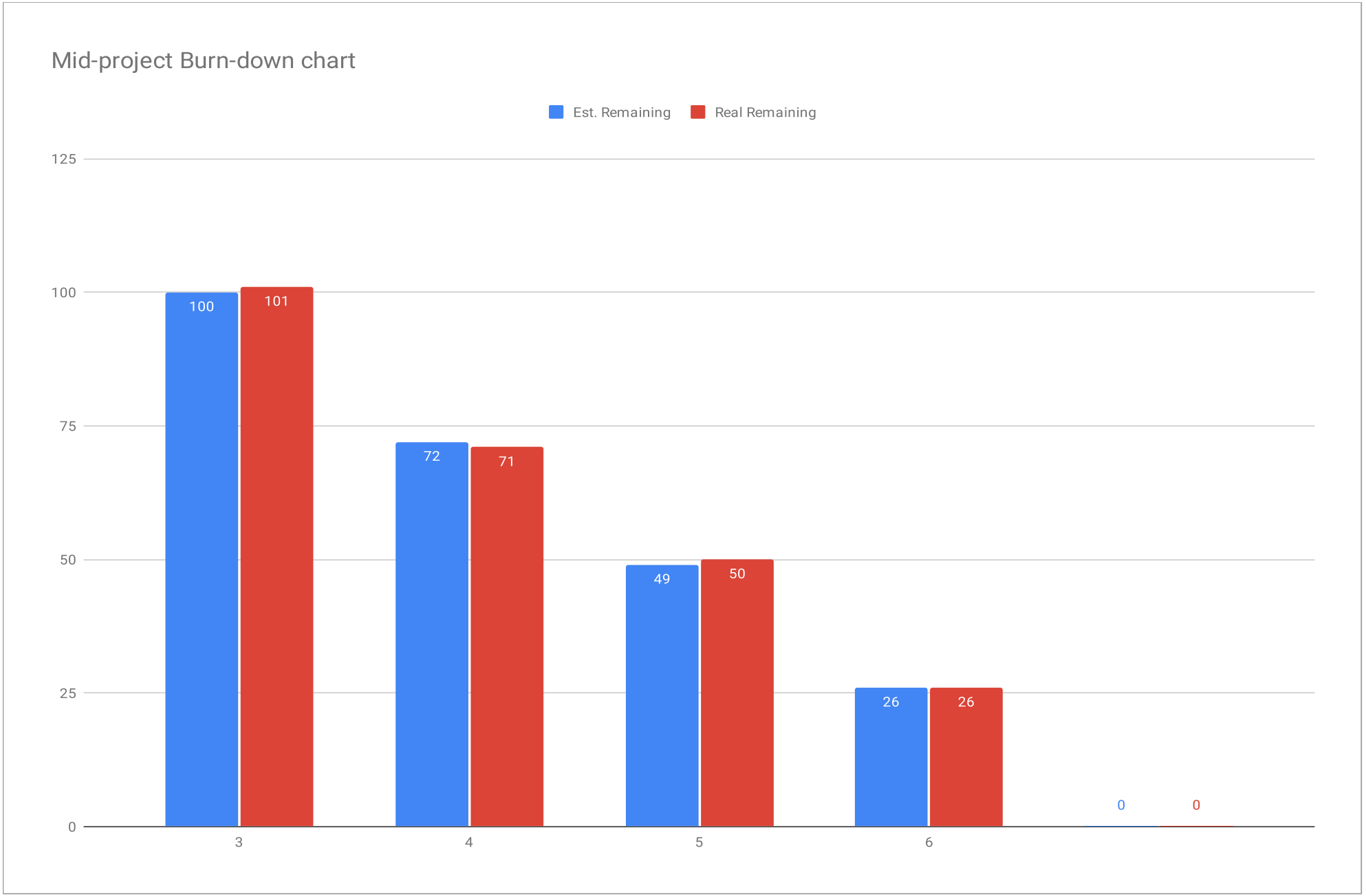
#	Meeting Day	Uni	Comment	Product Owner	Software Developer	Release Manager	Scrum Master
1	2022-04-27			Andreas Hellmich / Florian Schels	Everyone else	N/A	Maximilian May
2	2022-05-04			Andreas Hellmich / Florian Schels	Everyone else	Andreas Hellmich	Maximilian May
3	2022-05-11	Yes		Andreas Hellmich / Florian Schels	Everyone else	Tariq Hussain Magsi	Andreas Hellmich / Florian Schels
4	2022-05-18			Florian Schels	Everyone else	Bilal Asghar Aziz	Maximilian May
5	2022-05-25	Yes		Andreas Hellmich	Everyone else	Ali Asghar	Maximilian May
6	2022-06-01			Florian Schels	Everyone else	Tariq Hussain Magsi	Maximilian May
7	2022-06-08	Yes	Mid-term due	Andreas Hellmich	Everyone else	TEJESH PALA	Maximilian May
8	2022-06-15			Florian Schels	Everyone else	Uday Varun Kothapalli	Maximilian May
9	2022-06-22			Andreas Hellmich	Everyone else	Ali Asghar	Maximilian May
10	2022-06-29	Yes		Florian Schels	Everyone else	Fazeel Arif	Maximilian May
11	2022-07-06			Andreas Hellmich	Everyone else	Uday Varun Kothapalli	Maximilian May
12	2022-07-13			Florian Schels	Everyone else	Bilal Asghar Aziz	Maximilian May
13	2022-07-20	Yes		Andreas Hellmich	Everyone else	TEJESH PALA	Maximilian May
14	2022-07-27		Demo day!	Andreas Hellmich / Florian Schels	Everyone else	Fazeel Arif	Maximilian May
15	2022-08-03		Retrospective	Andreas Hellmich / Florian Schels	Everyone else	TEJESH PALA	Maximilian May

Product Vision	Project Mission
The EMBA environment helps IT-Security professionals to get an easy and uncomplicated overview over vulnerabilities in firmware files. Its analysis process is started by an automated download of firmware files, which then are investigated for vulnerabilites. Users can acces EMBArk, a webbased dashboard, in order to obtain insights into the results. The whole product is based on a modular structure so only a part of the functionalities can be used, as well as the selection of vendors can be limited or easily expanded by adding additional modules.	The mission of this project is to create a fully automated and modularized firmware crawler, that can crawl vendor websites regularly and unsupervised for previously unknown firmware images. The found images are then added to EMBArk, where the vulnerability analysis is executed, logged and visualized.

Term	Definition
major bug	A bug that results in an unexpected outcome, either visible to the user or persisted within the database.

#	Theme	Goal	Feature Name	Est. Size (Feature)	Est. Size (Sprint)	Real Size (Feature)	Real Size (Sprint)	Burn-Down
Project								
	Total			100		101		
Sprints								
				Est. Size	**Est. Remaining**	**Real Size**	**Real Remaining**	
3	**Project Research**			28	100	30	101	
4	**Project Setup**			23	72	21	71	
5	**Download Module**			23	49	24	50	
6	**Additional Vendor Modules**			26	26	26	26	
					0		0	
3	**Project Research**				**28**		**30**	
		Research & Planning						
			Examination of Asus_Harvest	5		5		
			Examination of firmadyne scraper	5		5		
			Examination of Belkin_Harvest	5		5		
			Examination of Sitecom_Harvester	5		5		
			Creation of Database Model	5		5		
			Creation of Architectural Design Documents	3		5		
4	**Project Setup**				**23**		**21**	
		Create basic software modules						
			Create Firmware Download Executer	5		3		
			Extract Metadata from firmware file	5		5		
			Examination of ABB firmware download area	5		5		
			Create Database	8		8		
5	**Download Module**				**23**		**24**	
		Create first vertical slice (Download -> DB)						
			Examination of GE firmware download area	5		3		
			Save metadata to database	5		5		
			Examination of 'Firmware-Scrapers'	5		8		
			JSON configuration file	3		3		
			Examination of Schneider Electric firmware download area	5		5		

#	Theme	Goal	Feature Name	Est. Size (Feature)	Est. Size (Sprint)	Real Size (Feature)	Real Size (Sprint)	Burn-Down
6	**Additional Vendor Modules**				**26**		**26**	
		Creation of multiple vendor modules						
			Download Module for Schneider Electric	5		5		
			Check if firmware is new	5		5		
			Download Module for GE	8		8		
			Download Module for Honeywell	8		8		

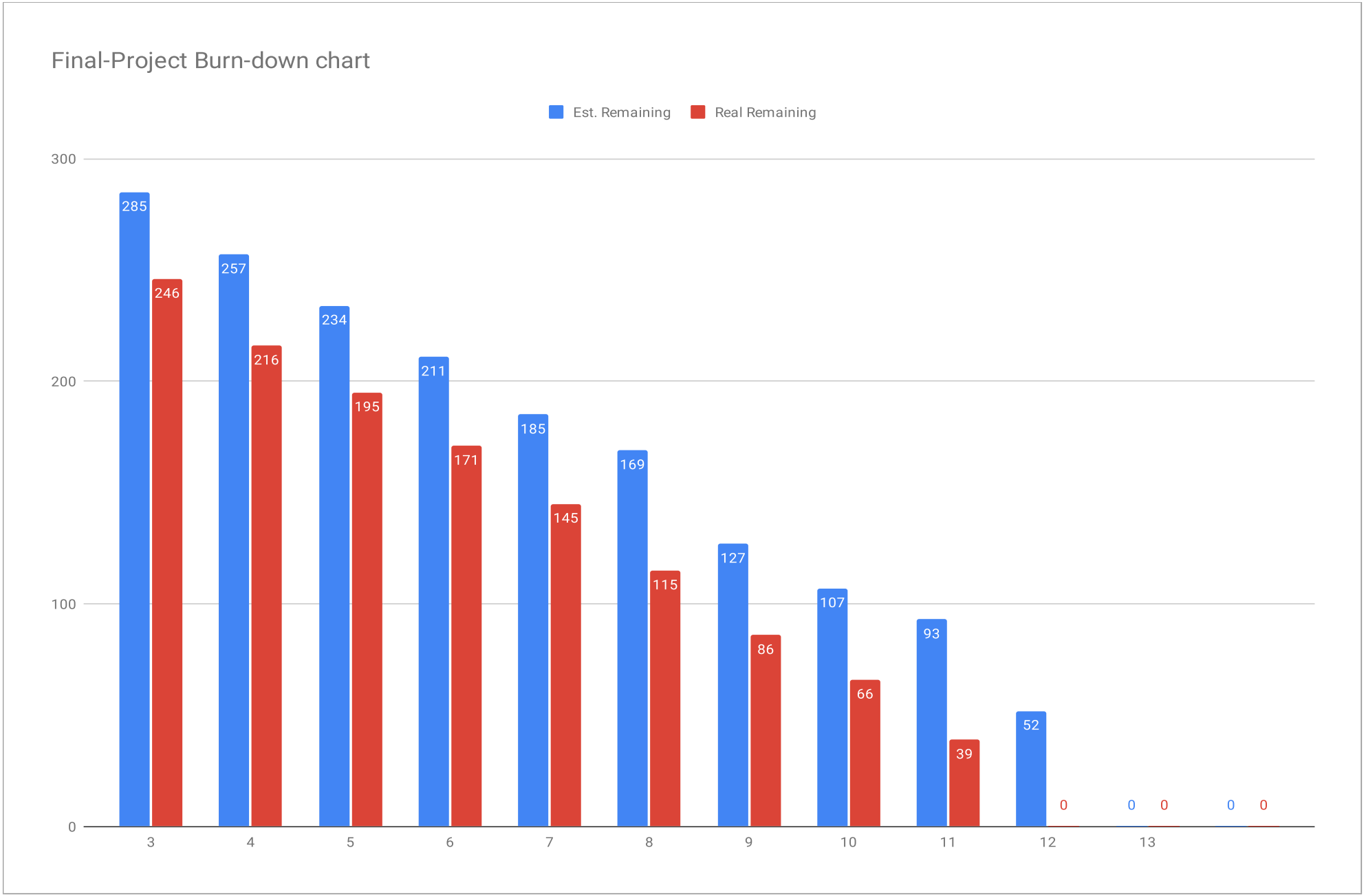

Mid-project Burn-down chart
Est. Remaining
Real Remaining
125
100
75
50
25
0
100
101
72
71
49
50
26
26
0
0
3
4
5
6

#	Theme	Goal	Feature Name	Est. Size (Feature)	Est. Size (Sprint)	Real Size (Feature)	Real Size (Sprint)	Burn-Down
Project								
	Total			285		246		
Sprints								
				Est. Size	**Est. Remaining**	**Real Size**	**Real Remaining**	
3	**Project Research**			28	285	30	246	
4	**Project Setup**			23	257	21	216	
5	**Download Module**			23	234	24	195	
6	**Additional Vendor Modules**			26	211	26	171	
7	**Prepare Embark Connection**			16	185	30	145	
8	**Project Cleanup & Development Tooling**			42	169	29	115	
9	**Automated Installation & Embark Connection**			20	127	20	86	
10	**Embark Connection & Error tolerant Environment**			14	107	27	66	
11	**Refactoring & Error tolearant Environment**			41	93	39	39	
12	**Increased vendor support**			52	52	0	0	
13					0		0	
					0		0	
3	**Project Research**				**28**		**30**	
		Research & Planning						
			Examination of Asus_Harvest	5		5		
			Examination of firmadyne scraper	5		5		
			Examination of Belkin_Harvest	5		5		
			Examination of Sitecom_Harvester	5		5		
			Creation of Database Model	5		5		
			Creation of Architectural Design Documents	3		5		
4	**Project Setup**				**23**		**21**	
		Create basic software modules						
			Create Firmware Download Executer	5		3		
			Extract Metadata from firmware file	5		5		
			Examination of ABB firmware download area	5		5		
			Create Database	8		8		
5	**Download Module**				**23**		**24**	

#	Theme	Goal	Feature Name	Est. Size (Feature)	Est. Size (Sprint)	Real Size (Feature)	Real Size (Sprint)	Burn-Down
		Create first vertical slice (Download -> DB)						
			Examination of GE firmware download area	5		3		
			Save metadata to database	5		5		
			Examination of 'Firmware-Scrapers'	5		8		
			JSON configuration file	3		3		
			Examination of Schneider Electric firmware download area	5		5		
6	**Additional Vendor Modules**				**26**		**26**	
		Creation of multiple vendor modules						
			Download Module for Schneider Electric	5		5		
			Check if firmware is new	5		5		
			Download Module for GE	8		8		
			Download Module for Honeywell	8		8		
7	**Prepare Embark Connection**				**16**		**30**	
		Research on Embark connection options; additional vendor modules						
			Investigation of Embark Database & FileStorage	5		8		
			Execute Data Scan regularly	-		-		
			Test cases for GE download module	-		-		
			Add filename field to database	1		1		
			Honeywell downloader for third category	5		8		
			Test cases for Honeywell download module	-		-		
			Download Module for ABB	5		13		
8	**Project Cleanup & Development Tooling**				**29**		**29**	
		Revert previous mistakes; streamline future development						
			Execute Data Scan regularly	-		-		
			Update Config.json	3		3		
			Creation of an error tolerant environment	-		-		
			Update main.py	-		-		
			Automated CodeChecks	8		8		
			Repository cleanup	5		5		
			Test cases for GE download module	5		5		
			Update vendor modules	-		-		
			Test cases for Honeywell download module	5		5		
			Refactor ABB	3		3		
9	**Automated Installation & Embark Connection**				**20**		**20**	
		Connect to Embark; Create installation script						
			Installation script	5		5		

#	Theme	Goal	Feature Name	Est. Size (Feature)	Est. Size (Sprint)	Real Size (Feature)	Real Size (Sprint)	Burn-Down
			Refactor metadata extraction from honeywell download module	5		5		
			Honeywell downloader for second category	-		-		
			Update main.py	-		-		
			Execute Data Scan regularly	5		5		
			Insert Data into EMBArk and execute Scan	-		-		
			Run unit tests as Github action	5		5		
			Creation of an error tolerant environment	-		-		
10	**Embark Connection & Error tolerant Environment**				**14**		**27**	
		Connect to Embark; Design of error tolerant environment						
			Update main.py	5		8		
			Refactor test_database.py	-		-		
			Actual linting	1		8		
			Creation of error tolerant environment	-		-		
			Insert Data into EMBArk and execute scan	-		-		
			Finish Schneider Electric implementation	5		8		
			Refactor test_check_duplicates.py	-		-		
			Refactor unit_tests.py	3		3		
			Honeywell downloader for second category	-		-		
11	**Refactoring & Error tolearant Environment**				**41**		**39**	
		Refactor code, fix linting issues; Design of error tolerant environment						
			Creation of error tolerant environment	8		8		
			Sanitize config input	-		-		
			Update all modules according to linting guideline	8		8		
			Honeywell downloader for second category	13		13		
			Refactor test_database.py	3		3		
			Insert Data into EMBArk and execute scan	-		-		
			Update database initialization	3		3		
			Refactor test_check_duplicates.py	3		3		
			GE file location storage	3		1		
			Use one download folder for all modules	-		-		
12	**Increased vendor support**				**52**		**0**	
		Add more (simple) vendor modules						
			Update vendor modules	8				
			Test cases for Schneider Electric download module	5				
			Refactor metadata_extractor.py	3				
			Test cases for ABB download module	5				

#	Theme	Goal	Feature Name	Est. Size (Feature)	Est. Size (Sprint)	Real Size (Feature)	Real Size (Sprint)	Burn-Down
			Insert Data into EMBArk and execute Scan	5				
			Automatically install Python	3				
			Download Module for Foscam	8				
			Use one download folder for all modules	3				
			Download Module for OpenWRT	8				
			Update config intervals	1				
			Sanitize config input	3				
13								


Final-Project Burn-down chart
Est. Remaining
Real Remaining
300
200
100
0
285
246
257
216
234
195
211
171
185
145
169
115
127
86
107
66
93
39
52
0
0
0
0
0
3
4
5
6
7
8
9
10
11
12
13

#	Feature Definition of Done	Sprint Release Definition of Done	Project Release Definition of Done
1	Code is complete	No major bugs	No major bugs
2	Code is uploaded in GitHub	vendor module test	Feature test coverage at/above 50%
3	Fulfills the acceptance criteria in the User Story		User documentation is available
4	Documentation has been updated		Developer documentation is available
5	Functionality has been reviewed		Installation script is available
6	Only MIT-Licensed Libraries are used		
7	Create tests necessary to ensure feature is working		
8	Bill of Materials updated		
9			
10			

Type	Link / reference

S.No	Context	Where do we use it (Files)	Name	Version	License	Comment
1	DB Management Initial Setup	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/database.py	SQLite3	SQLite 3.7.15	Open Source S/W	Internal Library of Python
2	OS Management for locating files on the OS Directories	test_check_duplicates.py	OS Library	Available with Python 3	Open Source S/W	Internal Library of Python
3	This is used to log diffecrent messages in the filesystem for backtracing the results	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/database.py	Logging Module	Available with Python 3	Open Source S/W	Internal Library of Python
4	Used for making threads in python	main.py	threading	Available with Python 3	MIT	External Library
5	Used for automation testing	almost all individual vendor modules	selenium	Available with Python 3	Apache 2.0	External Library
6	Used for making http requests	ge.py	requests	Available with Python 3	Apache 2.0	External Library
7	Used for scraping html from website	ge.py	BeautifulSoup	Available with Python 3	MIT	External Library
8	Used to manipulate different parts of the python runtime environment	ge.py	sys	Available with Python 3	Open Source S/W	Internal Library of Python
9	Used for time in python like intervals, sleep etc	ge.py	time	Available with Python 3	Open Source S/W	Internal Library of Python
10	Used for crone jobs	scanner.py	schedule	Available with Python 3	MIT	External Library
11	Used for unit testing	In test files	unittest	Available with Python 3	Open Source S/W	Internal Library of Python
12	Used to download utility; It download's from the url directly	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/chromium_downloader.py	wget	Available with Python 3	Open Source S/W	External Library
13	Used for Zip and Unzip actions using Python	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/chromium_downloader.py	zipfile	Available with Python 3	Open Source S/W	Internal Library of Python
14	Used for parsing	main.py	argparse	Available with Python 3	MIT	Internal Library of Python
15	Used for multiprocessing threads	__init__.py	multiprocessing	Available with Python 3	MIT	Internal Library of Python
16	Used for Regex mapping	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/vendors/honeywell.py	re	Available with Python >3.6	Apache 2.0	External Library
17	Used for Decoding an encrypted string	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/vendors/honeywell.py	base64	Available with Python 3	Open Source S/W	Internal Library of Python
18	Used for inspect a directory to list the file locations	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/vendors/honeywell.py	inspect	Available with Python 3	Open Source S/W	Internal Library of Python
19	Used to read/write into a json or management	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/vendors/honeywell.py	json	Available with Python 3	Open Source S/W	Internal Library of Python
20	For sending web/ post requests	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/vendors/honeywell.py	urllib3	Available with Python >2.7	MIT License (MIT)	External Library
21	used to decode the encrypted url	https://github.com/amosproj/amos2022ss01-firmware-downloader/blob/development/vendors/honeywell.py	urllib.parse	Available with Python 3	Open Source S/W	Internal Library of Python
22						
23						

Last Name	First Name	Value					
Hellmich	**Andreas**						
Schels	**Florian**						
PALA	**TEJESH**						
May	**Maximilian**						
Kothapalli	**Uday Varun**			0	No size		
Magsi	**Tariq Hussain**			1	Trivial size		
Asghar	**Ali**			2	Small size		
Arif	**Muhammad Fazeel**			3	Medium size		
Aziz	**Bilal Asghar**			5	Large size		
				8	Very large size		
				13	Too large (size)		
		#SDs					
		6	0				

WHAT WENT WELL	WHAT DIDN'T GO SO WELL	YOUR QUESTIONS	IDEAS AND ACTIONS
Communication between POs + SMs	Communication overall; sprint backlog has not been done	Where there any issues understanding the tasks that should have been done?	Assignment of tasks to each member every week and deadline should be strict
	No progress in feature board	Is everbody understanding the scrum framework?	Software developers should ask about task if they have no assigned task because every week there should be task for each member
	No communication about problems between SDs and POs/SM	WHAT TASK SHOULD BE DONE. WHAT TASK IS ASSIGNED?	
	No Communication about the sprint delivery/planning by PO's - Sprint 1 start there is no communication	Is everybody sure where to find what information	Regular SD Meeting
			use the Happiness Index to mail regular updates
			Proper communication as sprint starts

1	How to install Embark if someone don't have Kali Linux?	Use Kali Linux inside a VM; if necessary Andreas can provide help with setting up a Hyper-V VM You might get it to run in other Linux-Distributions, but a Kali VM is the way to go
2	If someone stucks in programming of this software who will guide us?	Normally all coding related tasks are responsibility of the SDs. Please discuss problems with the other SDs first. However if the problem persists, we can of course also discuss them in the teammeeting or in a separate meeting and find a solution or workaround all together.
3	Who will check the code after implementation?	Release manager checks quality of the code before the teammeeting and has to ensure that everything is running as expected. POs confirm the features in the Sprint Review.
4	Do we also build a UI	No, EMBARK is the UI
5	How do we maintain the MySQL based DB for our Project?, Is it in a Server or a memory location in a file system? Can this be maintained in an Excel output or JSON or yaml or a db access file in local file system?	As per Industry Partner, the database will be made available offline so a sqlite library will be used based on intial setup The database uses a local .db extension file which will be used by SQLite and an internal library of Python
	Questions for additional Teammeeting - 2	
1	Demo for unit tests	https://docs.python.org/3/library/unittest.html
2	Demo of actual Release Process	https://git-scm.com/book/en/v2/Git-Basics-Tagging
3		
4		
5		
6		
7		
8		
9		

No.	Sprint	Impediment	Explanation	Solution	Source	Status
1	3	Uneffective Teammeeting	Poor participation in the discussions	Turning cameras on. Improve Team spirit.	Max	improved
2	3	Lack of communication during sprint		Finally everybody joined slack. Explanations and motivational email hopefully helped.	Max	improved
4	3	Lack of understanding duties and SCRUM Framework	Way too many questions, which should have been clear for a long time	An additional, not mandatory meeting was held where SM and POs offered to answer remaining questions. Nobody showed up, but previously handed in questions have been answered. I expect fully working processes and teammeetings from now on.	Max	improved
5	3	Unorganized and uninformed teammembers	Too many questions regarding links, documents etc.	Please organize yourselves. Set up folders and bookmarks for all the information and documents we need in this project.	Andreas	improved
7	4	Very late commits; unsigned commits	If you commit your work 30 minutes before teammeeting there is no time for the release manager to prepare a working demo. If you dont sign your commits, the teaching team does not know who did the work.	Issue has been discussed in team meeting and feedback email. Solution should be obvious, please organize your tasks and duties together as SDs.	POs	approached
8	4	Meeting takes too long	1) Little tasks requested by SM/POs during meetings (f.e. in Retro) take too long. 2) Sprint review takes too long.	1) We still need better participation in the teammeeting. 2) Please try to quickly present your key results and be ready to share your screen.	Max	improved
9	5	Problems are indicated too late	Please check for problems/missunderstandings/questions as early as possible. If POs are contacted on monday evening (or not at all), the timeframe for solutions is too short.	POs opened a new slack channel specifically for questions regarding them and the features. Please use it as often as necessary.	POs	improved
10	5	Lack of teamwork between SDs	Lack of teamwork and communication between SDs during the sprint.	Please connect at least in teams of two and talk about your concept before the actual implementation of the features. Check each others code afterwards before the sprint review. With this approach we can really get the best ideas and solutions out of our team.	Max	improved
11	6	Rate of rejected features too high	Too many features were rejected in the sprint review. Many tasks are only completed after repeated reminders by POs/SM.	Please connect together as SDs, assign the features, talk about your ideas and concepts and motivate each other.	Max	improved
12	7	Missing testcases	In order to quickly review features and test them sufficiently, unittests should be build and demoed by the SDs.	An additional meeting was held, where POs explained the topic.	POs	improved
13	7	Problems with release process	We still did not have a correct release process yet.	An additional meeting was held, where POs and SM explained the topic again.	Max	approached
14	8	Rate of rejected features still too high (same impediment as nr. 11, but new solution)	Too many features were rejected in the sprint review. Many tasks are only completed after repeated reminders by POs/SM.	An additional mandatory meeting will be held every friday, where SDs can present their ideas/concepts and ask questions to POs (and SM).	Max	improved
15	11	Rate of rejected and uncompleted features still too high (same impediment as nr. 11, but new solution)	Too many features were rejected in the sprint review or just not completely finished.	Please create per-issue Pull Requests on the dev-branch, which will then be merged by POs.	POs	approached