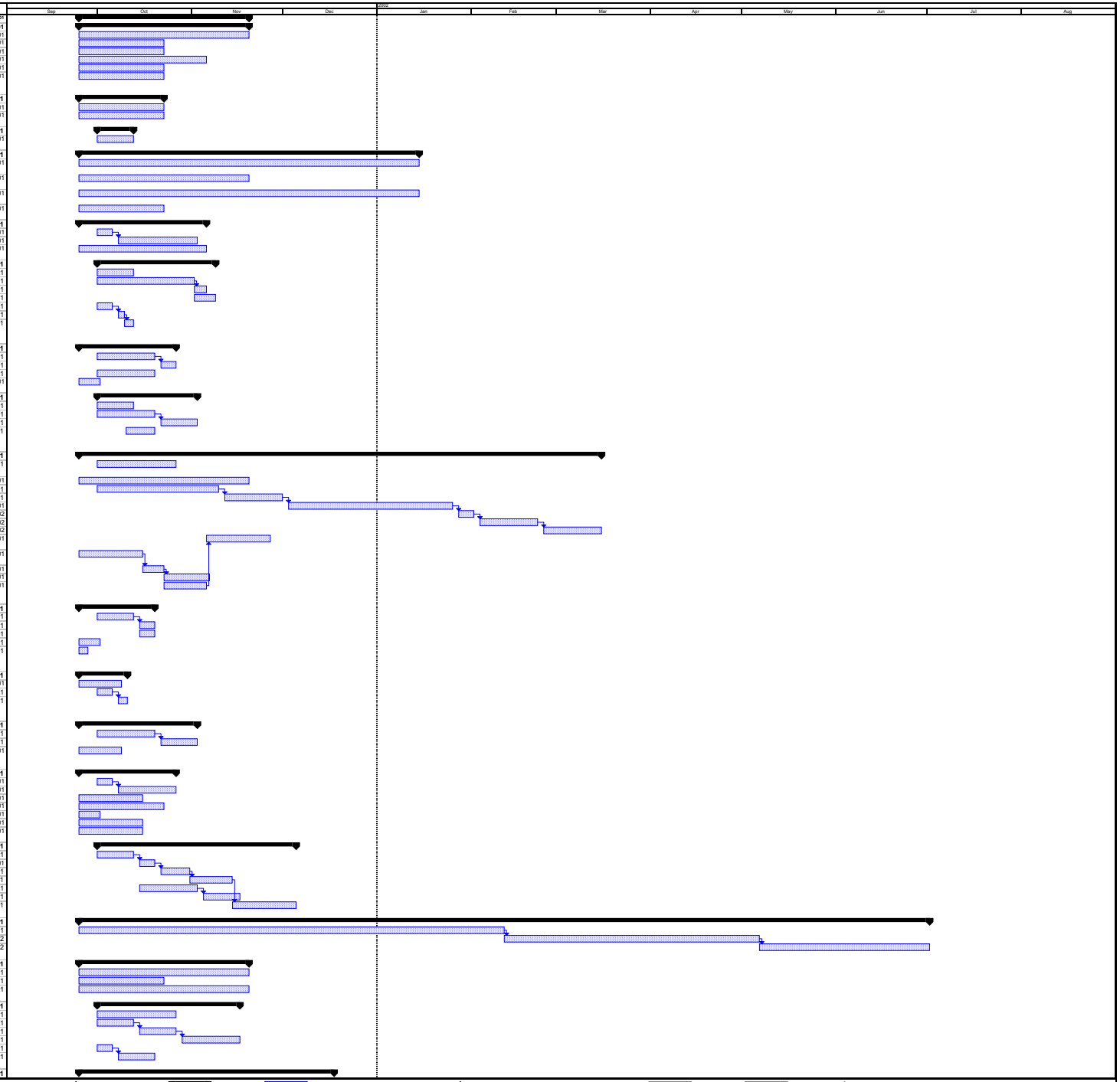
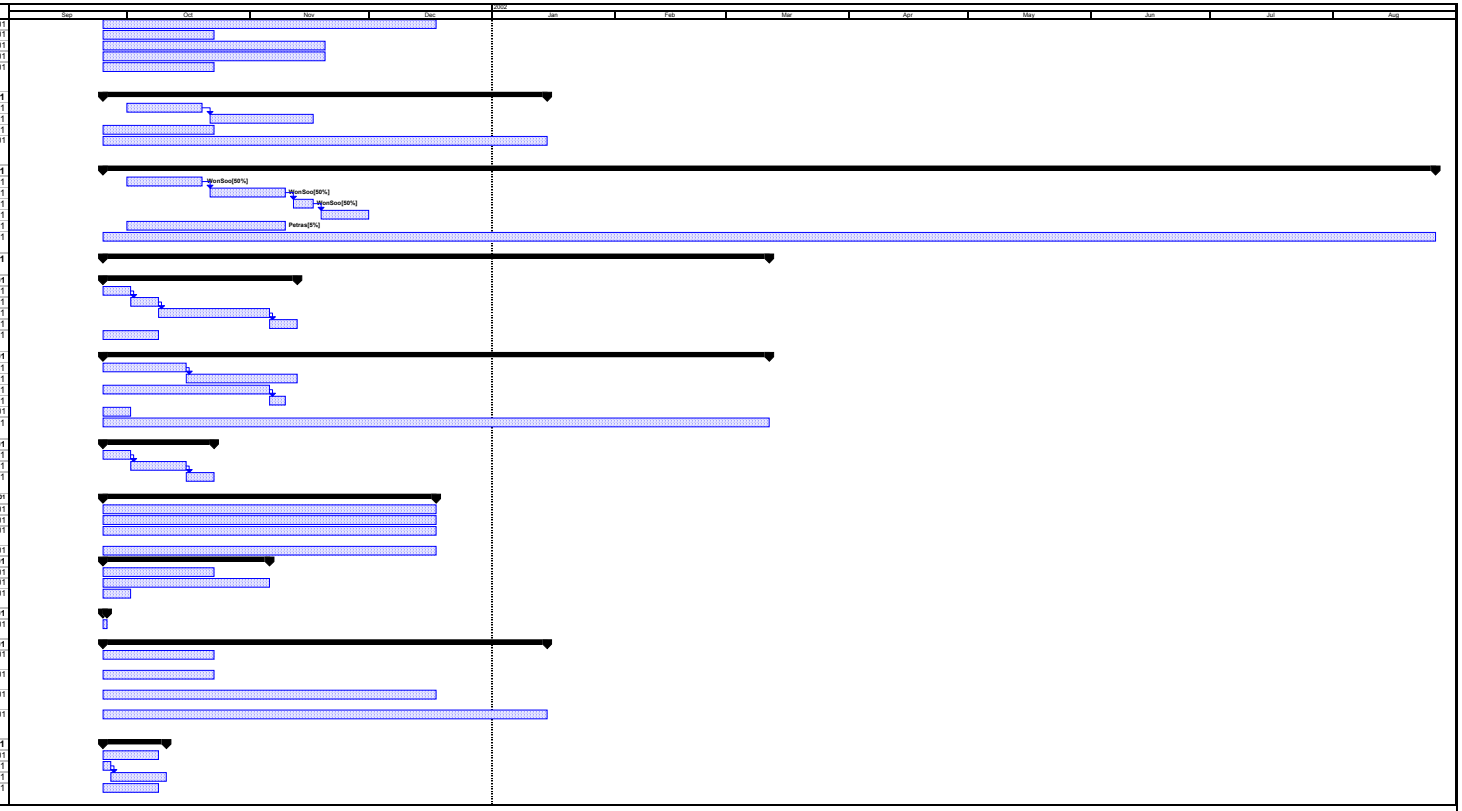
ID	Task Name	Duration	Start
1	**Integration of CLARAty and FIDO**	**40 days**	**Tue 9/25/01**
2	**Adapt Motion Control Package to FIDO Motion Control (PID in S/W**	**40 days**	**Tue 9/25/01**
3	Specialize generic classes and fine tune for FIDO	2 mons	Tue 9/25/01
4	Extend CLARAty structure to incorporate generic FIDO functionality	1 mon	Tue 9/25/01
5	Adapt Camera and Vision classes to FIDO	1 mon	Tue 9/25/01
6	Adapt I/O and other sensors to FIDO	1.5 mons	Tue 9/25/01
7	Adapt Manipulation Package for Arm and Mast	1 mon	Tue 9/25/01
8	Validate, test, and demonstrate Locomotion, Navigation, and Manipula	1 mon	Tue 9/25/01
9	**Navigation Package**	20 days	**Tue 9/25/01**
10	Integrate FIDO navigation into the Navigation Package	1 mon	Tue 9/25/01
11	Adapt and test FIDO Navigation (CLARAty integrated) on Rocky 8 a	1 mon	Tue 9/25/01
12	**Documentation**	10 days	**Mon 10/1/01**
13	Web-based Code Documentation and the FIDO adaptation	2 wks	Mon 10/1/01
14	**Estimation Package (CLARAty)**	80 days	**Tue 9/25/01**
15	Generalize the estimation package to support different applications & p	4 mons	Tue 9/25/01
16	Work with newly funded RMSA activities (Stergios, Dubowsky, Borenst	2 mons	Tue 9/25/01
17	Provide a 6-DOF pose estimation for rover classes - investigate work d	4 mons	Tue 9/25/01
18	Integrate and test on Rocky 8 and K9	1 mon	Tue 9/25/01
19	**Locomotion Package - REE**	30 days	**Tue 9/25/01**
20	REE - Extend Trajectory Generator to support continuous Profiling	1 wk	Mon 10/1/01
21	REE - Extend Locomotor for continuous driving	1 mon	Mon 10/8/01
22	Extend Locomotor classes to support Hyperion Rover (CMU)	1.5 mons	Tue 9/25/01
23	**Input/Output Package**	29 days	**Mon 10/1/01**
24	Redesign Bits class for efficiency & STL support	2 wks	Mon 10/1/01
25	Redesign Digital I/O classes using new paradigm for hw interface	1.2 mons	Mon 10/1/01
26	Readapt Rocky 8 Digital I/O classes (Widget Board) to new desi	2 days	Fri 11/2/01
27	Readapt Rocky 7 Digital I/O classes (VPAR10 Board) to new de	1 wk	Fri 11/2/01
28	Redesign Analog I/O classes using new paradigm for hw interfac	1 wk	Mon 10/1/01
29	Readapt Rocky 8 Analog I/O classes (Widget Board)	2 days	Mon 10/8/01
30	Readapt Rocky 7 Analog I/O classes (VADC20 Board)	3 days	Wed 10/10/01
31	**Math Infra-structure Package**	24 days	**Tue 9/25/01**
32	Redesign Array Hierarchy to support copy/no-copy sub-sampling	3 wks	Mon 10/1/01
33	Adjust Matrix Hierarchies to support Array changes	1 wk	Mon 10/22/01
34	Improve and automate Array/Matrix test & verification	3 wks	Mon 10/1/01
35	Extend Matrix functionality to support SVD	1 wk	Tue 9/25/01
36	**Transformations & Frames Package**	25 days	**Mon 10/1/01**
37	Redesign Location class to support both HTrans & Quaternions i	2 wks	Mon 10/1/01
38	Design/use multi-thread safe Tree class (e.g. STL) for Frame	3 wks	Mon 10/1/01
39	Redesign Frame class using new Tree/Node classes	2 wks	Mon 10/22/01
40	Develop regression test for Tree & Frame classes	1.5 wks	Wed 10/10/01
41	**Vision & Cameras Packages**	124 days	**Tue 9/25/01**
42	Combine JPLPic/Image/Ames/CMU Image classes into a single t	1 mon	Mon 10/1/01
43	Develop/Integrate basic 2-D image operations (e.g. blob detection, edg	2 mons	Tue 9/25/01
44	Develop classes for 3-D Maps	1.5 mons	Mon 10/1/01
45	Develop Generic Stereo classes to support Ames, JPL & SRI ste	3 wks	Mon 11/12/01
46	Re-implement portions of JPL Stereo to leverage Math infrastructure	2 mons	Mon 12/3/01
47	Comparison test for processing efficiency	1 wk	Mon 1/28/02
48	Adapt JPL Stereo to new Stereo class interface	3 wks	Mon 2/4/02
49	Validation test of stereo engine on all rover platforms	3 wks	Mon 2/25/02
50	Adapt Ames Stereo to new stereo class interface	3 wks	Tue 11/6/01
51	Design Camera class to combine several implementations (JPL, Ames,	3 wks	Tue 9/25/01
52	Review current Camera Model classes to use Frames	1 wk	Tue 10/16/01
53	Adapt Rocky 7 Camera class to use new base Camera classes	2.2 wks	Tue 10/23/01
54	Redesign Rocky 8 Camera class to use new Camera classes	2 wks	Tue 10/23/01
55	**Motion Control Package**	19 days	**Tue 9/25/01**
56	Enhance Motor classes to support time stamped measurements	2 wks	Mon 10/1/01
57	Enhance Trajectory Generator to Support continuous motions	1 wk	Mon 10/15/01
58	Enhance Sim_Motor class (simulation) to use Trajectory Generat	1 wk	Mon 10/15/01
59	Complete Rocky 8 Motor class adaptation to support all control m	1 wk	Tue 9/25/01
60	Improve Rocky 7 Motor class adaptation (remove ties to R7 MC I	3 days	Tue 9/25/01
61	**Rover Package**	12 days	**Tue 9/25/01**
62	Reorganize rover classes to clean up FY01 demo shortcuts	2 wks	Tue 9/25/01
63	Move power and energy estimation to appropriate sub-classes	1 wk	Mon 10/1/01
64	Clean up Rover control/query interface	3 days	Mon 10/8/01
65	**Communication Package**	29 days	**Tue 9/25/01**
66	Change specialized Message classes to serializable object IO cla	3 wks	Mon 10/1/01
67	Complete UDP support for Socket classes	2 wks	Mon 10/22/01
68	Investigate use of higher-level communication objects that support varie	2 wks	Tue 9/25/01
69	**Inertial & Heading Sensors Package**	24 days	**Tue 9/25/01**
70	Review and improve design of generic Serial class	1 wk	Mon 10/1/01
71	Redesign IMU class to use new paradigm for H/W interface	3 wks	Mon 10/8/01
72	Complete DMU-HDX driver to support all modes of IMU operations	3 wks	Tue 9/25/01
73	Develop a generic Sun Sensor class using Fido software	4 wks	Tue 9/25/01
74	Develop a camera based specialization for Sun Sensor class	1 wk	Tue 9/25/01
75	Adapt Sun sensor class to Rocky 7 using new H/W interface	3 wks	Tue 9/25/01
76	Adapt Sun Sensor class to Rocky 8 using new H/W interface	3 wks	Tue 9/25/01
77	**Manipulation Package**	47.5 days	**Mon 10/1/01**
78	Integrate new Motor classes into Manipulator class	2 wks	Mon 10/1/01
79	Refactor manipulator trajectory profiling for straight line motions from R	1 wk	Mon 10/15/01
80	Use the HTrans/Quaternion classes for forward kinematics	1.5 wks	Mon 10/22/01
81	Adapt & test Rocky 7 Arm class using new Manipulator class	2 wks	Wed 10/31/01
82	Adapt & test Rocky 8 Arm class using new Manipulator classes	3 wks	Mon 10/15/01
83	Adapt & test Rocky 7 Mast class using new Manipulator class	2 wks	Mon 11/5/01
84	Adapt & test Rocky 8 Mast class using new Manipulator classes	3 wks	Wed 11/14/01
85	**Connector Package**	200 days	**Tue 9/25/01**
86	Develop Functional Layer Parser and XML class representation	5 mons	Tue 9/25/01
87	Auto generate functional information and link to Decision Layer	3 mons	Tue 2/12/02
88	Redesign Functional Layer executive to support it	2 mons	Tue 5/7/02
89	**Internal Code Reviews & Design Discussions**	40 days	**Tue 9/25/01**
90	Code Review for all for FY01 & FY02	2 mons	Tue 9/25/01
91	Clean up the inconsistencies in name conventions	1 mon	Tue 9/25/01
92	Regular formal test cycles and code releases	2 mons	Tue 9/25/01
93	**Adaptation - K9 Rover**	35 days	**Mon 10/1/01**
94	Combine K9-Pilot code and features into Locomotor class	1 mon	Mon 10/1/01
95	Adapt K9 Motor (PICServos) to Ctrl_Motor	2 wks	Mon 10/1/01
96	Develop & Test K9_Locomotor class Adaptation	2 wks	Mon 10/15/01
97	Integrate Gestalt/Stereo on K9	3 wks	Mon 10/29/01
98	Adapt K9 Arm Motor to Ctrl_Motor	1 wk	Mon 10/1/01
99	Re-integrate K9 Arm class using new Manipulator classes	2 wks	Mon 10/8/01
100	**Adaptation - FIDO Rover**	60 days	**Tue 9/25/01**



Project: REE Project
Date: Fri 4/30/04

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary | External Milestone

ID		Task Name	Duration	Start
101		Adapt Motion Control Package to FIDO Motion Control (PID in S/W)	3 mons	Tue 9/25/01
102		Adapt Camera classes to FIDO	4 wks	Tue 9/25/01
103		Adapt I/O and other sensors to FIDO	2 mons	Tue 9/25/01
104		Adapt Manipulation Package for Arm and Mast	2 mons	Tue 9/25/01
105		Validate, test, and demonstrate Locomotion, Navigation, and Manipula	1 mon	Tue 9/25/01
106		**Adaptation - ROAMS Rover Simulator**	80 days	**Tue 9/25/01**
107		Establish image transfer from ROAMS to CLARAty	3 wks	Mon 10/1/01
108		Test Stereo processing on simulated images	1 mon	Mon 10/22/01
109		Develop a motor sim that attaches to ROAMS	1 mon	Tue 9/25/01
110		Develop Simulation classes for all generic physical classes	4 mons	Tue 9/25/01
111		**Integrate CLARAty for REE Project**	240 days?	**Tue 9/25/01**
112		Learning Rocky 8 Environment	3 wks	Mon 10/1/01
113		Developing main control loop	3 wks	Mon 10/22/01
114		Debug main control loop	1 wk	Mon 11/12/01
115		Optimize and fine tune	2 wks	Mon 11/19/01
116		CLARAty Support Personnel	30 days?	Mon 10/1/01
117		Test Modules	12 mons	Tue 9/25/01
118		**Rocky 8/CLARAty Hardware Development & Upgrades**	120 days?	**Tue 9/25/01**
119		**Rocky 8 - Upgrading Vision System**	**35 days**	**Tue 9/25/01**
120		Test FireWire Cameras Standalone	1 wk	Tue 9/25/01
121		Test Stereo Processing using FireWire Cameras	1 wk	Tue 10/2/01
122		Port/Integrate FireWire Communication Software	1 mon	Tue 10/9/01
123		Setup cameras in cPCI box & test	1 wk	Tue 11/6/01
124		Install Firewire Cameras on mast and calibrate	2 wks	Tue 9/25/01
125		**Rocky 8 - Upgrading Motion Control**	**120 days**	**Tue 9/25/01**
126		Replace all motor with 100 line encoders	3 wks	Tue 9/25/01
127		Fix mechanical mounts on widget boards	1 mon	Tue 10/16/01
128		Replace PICs with inline progamming PICs (18xx)	1.5 mons	Tue 9/25/01
129		Update firmware to support is new features (e.g. is_moving())	4 days	Tue 11/6/01
130		Use a Widget Board as I2C Master	1 wk	Tue 9/25/01
131		New widget board design and layout	6 mons	Tue 9/25/01
132		**Rocky 8 - Upgrading Computational Platform**	**20 days**	**Tue 9/25/01**
133		Select new processor board for Rocky 8 cPCI chassis	1 wk	Tue 9/25/01
134		Replace Processor with 800 MHz x86	2 wks	Tue 10/2/01
135		Setup ethernet to work at 100M bits	1 wk	Tue 10/16/01
136		**Rocky 8 - Upgrading Power System**	**60 days**	**Tue 9/25/01**
137		Provide real data on energy usage and state	3 mons	Tue 9/25/01
138		Provide an external meter for energy/power levels	3 mons	Tue 9/25/01
139		Battery charging - enable from solar cells and from external supply	3 mons	Tue 9/25/01
140		Complete solar cells on topdeck	3 mons	Tue 9/25/01
141		**Rocky 8 - REE & other**	**30 days**	**Tue 9/25/01**
142		Add motor, sesnsor and controller for the gripper	1 mon	Tue 9/25/01
143		Integrate Spectrometer from Len Dorsky to mast	1.5 mons	Tue 9/25/01
144		Install G4 laptop in Rocky 8	1 wk	Tue 9/25/01
145		**Rocky 7 - Upgrade Computational Platform**	**1 day?**	**Tue 9/25/01**
146		Replace CPU to PPC (m68K not longer supported by vxWorks)	1 day?	Tue 9/25/01
147		**Benchtop CLARAty Test infrastructure**	**80 days**	**Tue 9/25/01**
148		Setup Rocky 7 benchtop with VME chassis, PPC, Vision boards (S/	1 mon	Tue 9/25/01
149		Setup Rocky 8 benchtop system cPCI chassis, with Framegrabber	1 mon	Tue 9/25/01
150		Setup FIDO benchtop system with motion control stack, digital and	3 mons	Tue 9/25/01
151		Setup K9 computational system with K9 motion control and vision s	4 mons	Tue 9/25/01
152		**Mars Yard Improvements/Maintainence**	12 days	**Tue 9/25/01**
153		Improve/Redesign wireless connectivity in Mars Yard	2 wks	Tue 9/25/01
154		Move out all old machines	2 days	Tue 9/25/01
155		Procure and upgrade Solaris machines	2 wks	Thu 9/27/01
156		Clean up lab and setup a tool box	2 wks	Tue 9/25/01



Project: REE Project
Date: Fri 4/30/04

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary | External Milestone