

# UI Debalers 2.0

## Instrumentation and Data Collection for Debaler Project Client Meeting Minutes

**Location:** Microsoft Teams/Conference Room

**Date:** 9-21-2020

**Attendees:** Evan Allen, Nathan Stout, Benjamin Zimmerman, Hope de Avila, Dr. Brian He, Cobi Brower and Dave Lanning

**Time:** 2:30-3:30p.m.

### • Meeting Agenda

- Client Meeting (Forest Concepts – Dave Lanning)
  - Ask Questions created by team about the project

### • Meeting Notes

- Introduced ourselves to the client, and then went through our team questions below
- First asked before the team questions was, "How frequently would you like to meet with us for this project?"
  - Client Answer: "Once a month is good, but I can do more or less, I am pretty flexible as far as that goes."

### Team Questions for Client (Dave Lanning)

1. What would you like improved to this design?

- A hands free system is desired which includes a conveyor feed, controls to prevent/notify bale jam(jamming) (automated like it would be in an industrial setting). Also would like a cleaner spread out of the bale as well as a measurement/control of the volumetric flow rate.

2. What does the final product look like to you?

- A set of design reports that show performance at varies speeds and with different materials, a working control algorithm and a solid running prototype.

3. What is most important design feature to add to this prototype (list of the order)?

- Automated system with a jam controller/signal

4. What wish list items do you have (wants not needs)?

- Consistent/uniform flow on outfeed (have x variance coming out of the machine) Jam fix is wanted, but also not required. Also, the string puller system would be cool, but is definitely on the wish list and is not a need.

5. Two Conveyor belts? Inlet only? Outlet Only?

- Two belts are desired, input and output.

6. Specific design ideas and importance of containing the loose material (straw/alfalfa/etc.)?

- The debaled material needs to come off cleaner and all make it through the chute.

7. Automated process for cutting strings?

- If unique/cool/inexpensive process and improvement, we can talk about it.

8. If strings cut, Automated process to pull/remove from bales?

- Definitely needs to be pulled from bale before it is fed into the system, but this is a wish list item.

9. Will the bales have strings or a wrap?

- Strings/twine are what is used for the 2000lbs (1 ton) which is what the automated final product needs to perform on. So the prototype will only deal with strings as well.

10. What type of bales would you like us to test?

- Most useful to use a variety of materials, but the main ones should be wheat straw, alfalfa, and Timothy hay.

11. Are you able to lend us bales or do we need to get them?

- We most likely need to find our own bales.

12. What type of control system would you like? (Automated or Manual)

- As automated as possible is preferred but our budget/time may not allow it, so a manual control of the system as in to change motor speeds is acceptable.

13. Would you like the conveyor belts to be constant and the forks change to correct output? Or vary output belt? Or intake belt?

- This is up to us, and we have room to design what we see as most optimum.

14. Variable speed belts as well?

- This is up to us, and we have room to design what we see as most optimum.

15. What kind of interface between operator and system? Do we want to have user input determine the amount of material dispensed?

- If we can make it work than we can go for it. Manual changes are acceptable since in industrial system large batches of the same material/size are sent through the system.

16. Would you like a digital display to read the values/real time system measurements?

- This is up to us, and we have room to design what we see as most optimum and can fit in our budget.

17. Would you like all motors to be simultaneously adjusted with one knob? Or everything/some of the motors adjusted independently?

- This is up to us, and we have room to design what we see as most optimum.

18. Any Safety Features added to prototype?

- Guarding (side panels of metal/plywood) during testing would be nice, not required but operate under safe conditions and operate system wisely. Emergency stops could be added but is not expected/required.

19. For prototype, what kind of performance (volumetric flow rate,etc.) is desired?

- We will report what our machine can do, and then we can scale to a large machine, the large machine should do about 5→10 1 ton bales per hour.

20. What is ideal maintenance/service life?

- Something that would last about 5→10 years of industrial use is ideal.

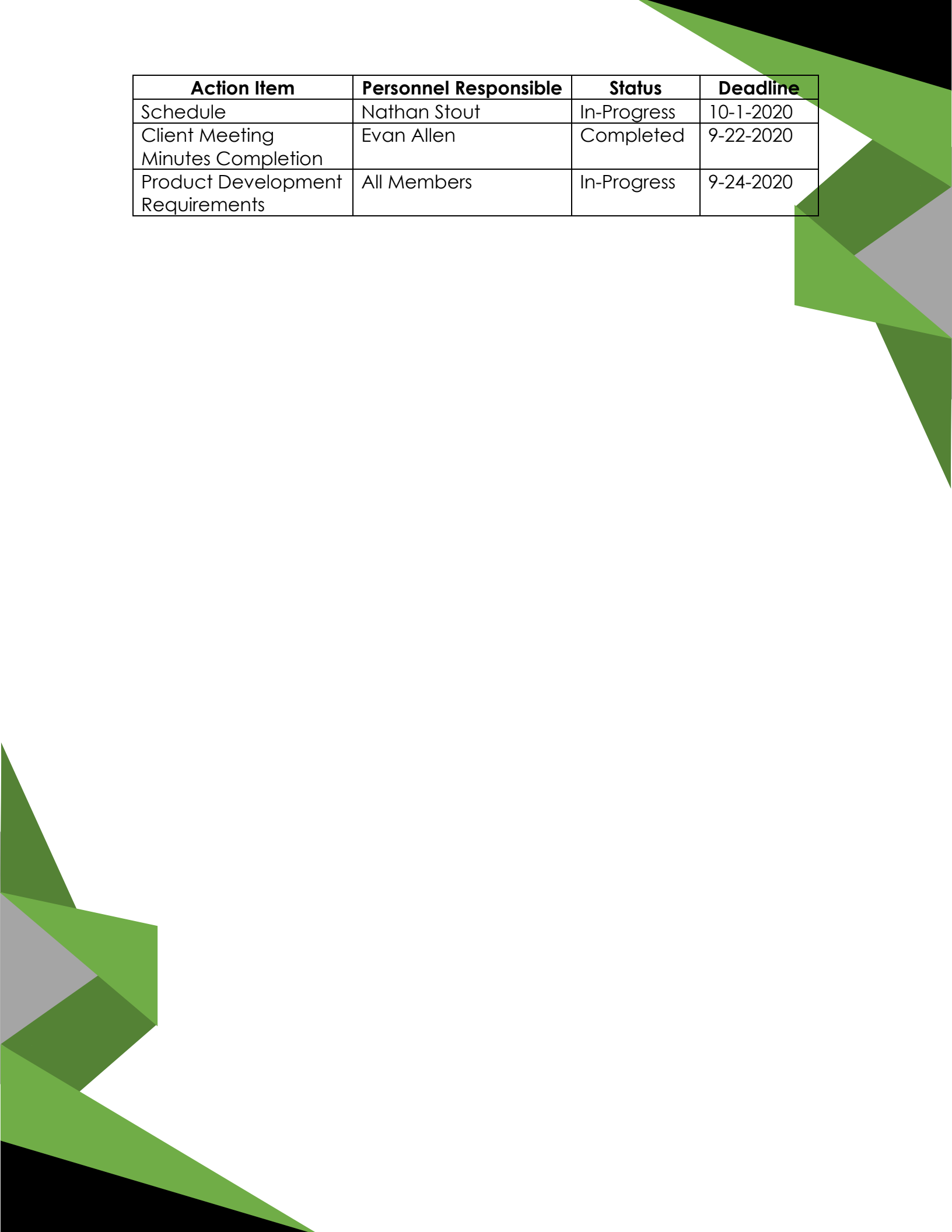
### • Client Questions for the Team

- How often does the team want to meet with the client?
  - Once a month or as needed works for everyone
- Who is the primary contact?
  - Nathan Stout is the primary contact but we may put together a single group email that contacts the entire team
- What does the finish product look like for our team?
  - We will send the Product Requirement Document to you before we submit, but we will hopefully get the conveyor belts rolling, and a working control algorithm along with a professional design portfolio by the end of the year.

### • More Questions that May Need Answered After Meeting?

- Advanced control systems are expensive, we need to either scale back and not overcommit our control system or negotiate a larger budget.
- Sensors are expensive and so are controls, this should be prioritized as it was one of the client's top needs.

### • Action Items



<b>Action Item</b>	<b>Personnel Responsible</b>	<b>Status</b>	<b>Deadline</b>
Schedule	Nathan Stout	In-Progress	10-1-2020
Client Meeting Minutes Completion	Evan Allen	Completed	9-22-2020
Product Development Requirements	All Members	In-Progress	9-24-2020