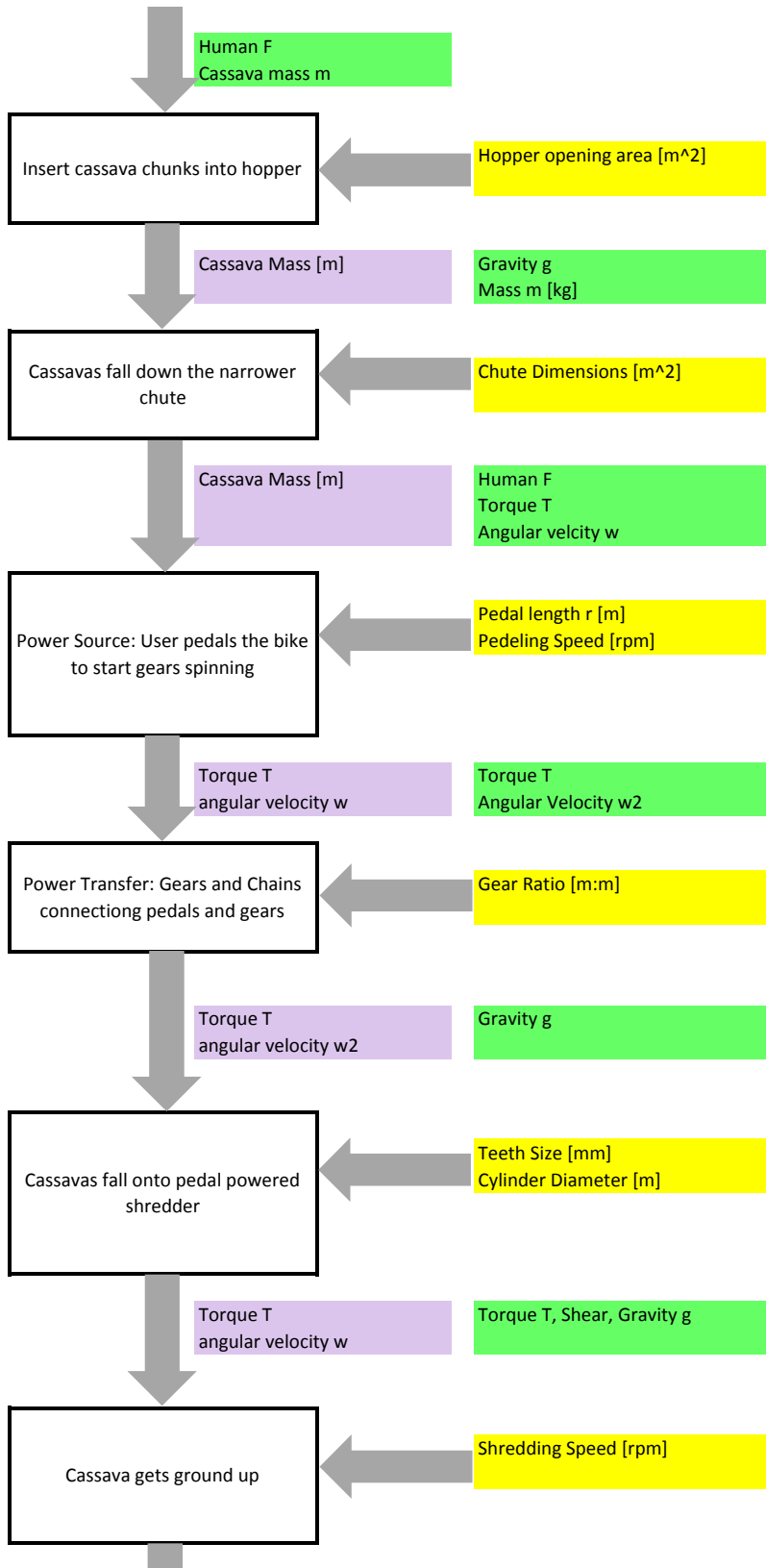


Design Concept 1, Pedal Powered Shredder Mathematical Model



Conversions:

Area = Length *width

Force = mass * acceleration

Insert Cassava	Input	F		N
		m		kg
	Control	A	0.95	m ²
Output	m		kg	

Conversions:

Area=Length*Width

Cassavas fall down chute	Input	g	9.81	m/s ²
		m		kg
	Control	A	0.9	m ²
Output	m		kg	

Conversions:

torque=force*radius

Power Source: Pedals via Bike	Input	F	100	N
		w	70	rpm
	Control	r (length)	0.165	m
		Speed	70	rpm
Output	w	70	rpm	
	T	16.5	Nm	

Conversions:

Angular Velocity=(w1*r*ratio)/r

Power Transfer: Gears/Chains	Input	T	16.5	Nm
		w1	70	rpm
	Control	ratio	1:.73	
Output	T	16.5	Nm	
	w2	95.89	rpm	

Conversions:

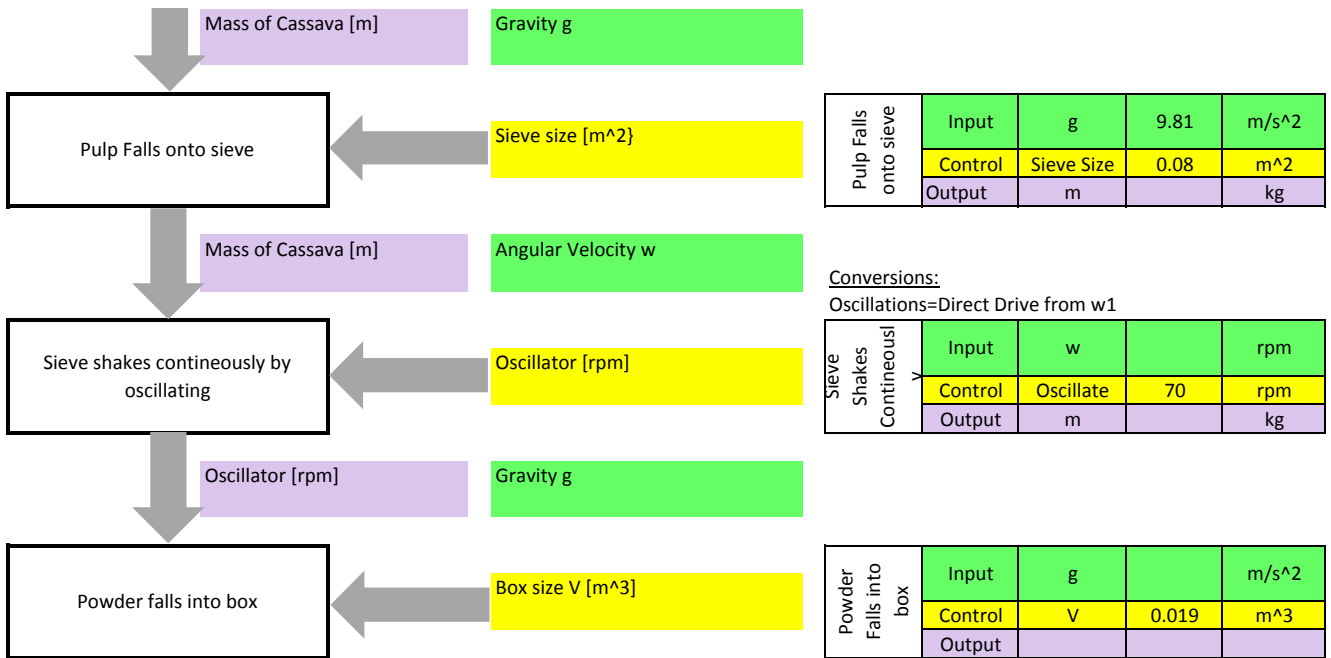
Torque=Force*radius

Cassavas fall onto Shredder	Input	T	16.5	Nm
		w	95.89	rpm
		g	9.81	m/s ²
	Control	Teeth	1.2	mm
		Diameter	0.08	m
	Output	T	8	Nm
	omega		rpm	

Cassavas Get Ground up	Input	T	8	N
		Shear		kg
		g	9.81	m/s ²
	Control	Shredding	96	rpm
Output	m		kg	

Design Concept 1, Pedal Powered Shredder
Mathematical Model

Team 3:G
2/14/2014



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