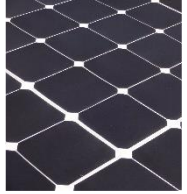
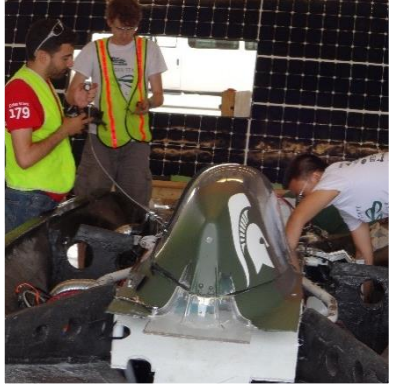
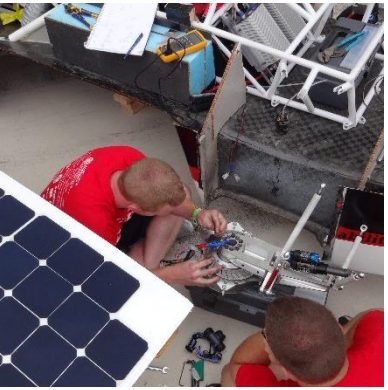










SOLAR CAR CONFERENCE | MARCH 20-22, 2015 | UNIVERSITY OF MICHIGAN

KNOWLEDGE TRANSFER, CONTINUITY, AND DOCUMENTATION

Aaron Frantz
Operations Director, University of Michigan Solar Car Team
22 March 2015

WHAT IS SOLAR CAR CONTINUITY?

http://i5.walmartimages.com/dfw/dce07b8c-f5ce/k2-_22df3627-d97c-4aa3-a8b8-37470a11fe8e.v1.jpg

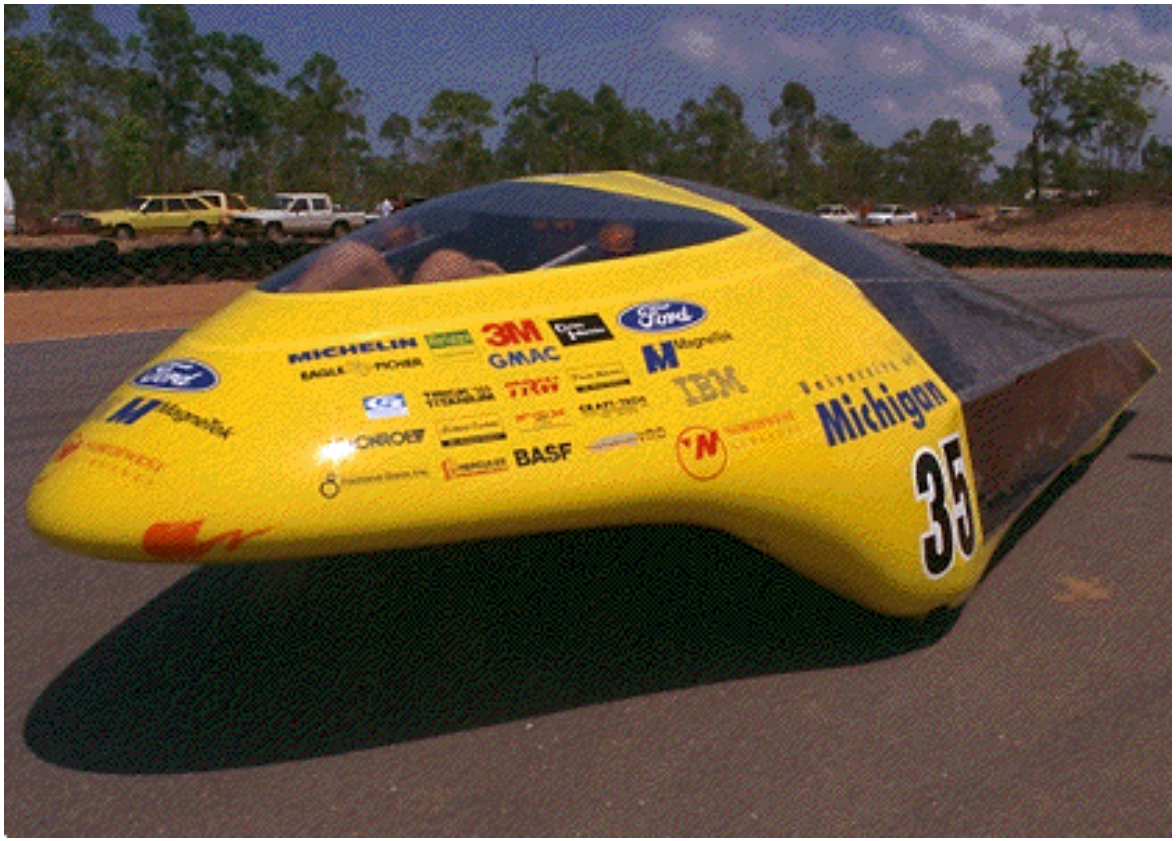
WHAT IS SOLAR CAR CONTINUITY?

http://upload.wikimedia.org/wikipedia/commons/9/9c/91-93_Chevrolet_Corsica.jpg

WHAT IS SOLAR CAR CONTINUITY?

http://bentley.umich.edu/legacy-support/automotive/images/solarcar.jpg

WHAT IS SOLAR CAR CONTINUITY?



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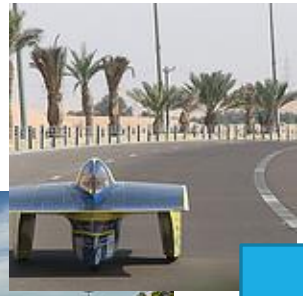
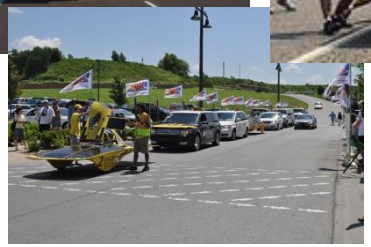
ABOUT ME

Why am I giving this presentation?

- On team since 2009
- Leading Operations since 2011
- Seen four cars and multiple leaderships come and go
- Each has had successes and failures in keeping the tradition alive




All photos umsolar

ABOUT THIS PRESENTATION

The Continuum of Action

- Knowledge transfer, ensuring team continuity, and documentation happen constantly
- Presenting in the rough order you'll see now

No Correct Answers

- I'll present expected problems, and possible solutions
- Tailor your implementation to what's most appropriate for your team

Broad Audience

- Covering a large range of experiences in this room
- Focusing more on the college-based team perspective

Violating the Cardinal Rule of PowerPoints

- Walls of text → Reference when these get posted

Michigan's Perspective

- Will include examples throughout of how Michigan's addressed (or not addressed) the challenges presented

CONTINUITY

What is Continuity?

Ensuring your team outlives your college career

Where can lapses occur?

- Leadership
- Team members
- Technical knowledge
- Hands-on skills
- Presence in race
- Sponsors
- Finances
- University relations
- Alumni relations
- Public relations
- Facilities
- etc…

CONTINUITY

Why does Continuity lapse?

- Teammates graduate…
- Teammates quit…
- Teammates get bored…
- Teammates get apathetic…
- Teammates stop using their skills…
- Teammates forget to follow up…
- Teammates don't lay framework…

} …and nothing is done about it

Some of these issues are just facts of life (e.g.: eventually leaving team)

- But you often see them coming

Most of these issues can be proactively managed

In either proactive or reactive management, you need a **PLAN**

CONTINUITY

http://static.ddmcdn.com/gif/blogs/6a00d8341bf67c53ef01761561042f970c-800wi.jpg

http://www.portlandmaine.com/wp-content/uploads/2013/03/sherlock_holmes.jpg

Your teammates are not psychic

You know from experience what fundamental things need to be carried through. They don't.

Your teammates are not superhumanly observant with photographic memories.

They will not pick up on every quirk and subtlety you show them.

They need a continuity plan

The plan starts with you

CONTINUITY – LEADERSHIP CONSIDERATIONS

How are new overall team leads selected, and when?

How are new technical division leads selected, and when?

What happens if someone quits or is fired?

What are you, as a leader, actually responsible for?

- Does the person taking over for you understand these requirements?
- Can the duties of the various leadership positions be shuffled around?

Do new leaders get involved with leadership while the old leaders are still present?

- e.g.: apprentices

Do you have heavily involved faculty advisers who assist with continuity? Do your faculty advisers play leadership roles on the team?

CONTINUITY – TEAMMATE CONSIDERATIONS

How easily can you recruit? What has your historical retention rate been? Do you have a "term limit"?

Why do people leave the team if not graduating? Is burnout or boredom a concern?

Can factors causing people to leave before graduation be mitigated?

If a team member is only marginally useful (or actively detrimental), is it more productive to keep them for their knowledge, or to ask them to leave and recruit/train a more enthusiastic member?

What are the opportunities for advancement within your team?

CONTINUITY – TECH AND SPONSOR CONSIDERATIONS

How can you keep hands-on skills fresh when new cars are at a minimum two years apart, and road rayces are two years apart?

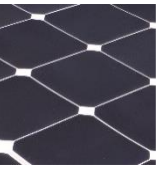
How do you capture all of the subtleties learned about software and processes?

How do you ensure sponsors are thanked properly after their initial contribution(s) is/are made?

How do you manage (and subsequently transition) a sponsor contact?

How do you ensure that sponsors can be renewed for the next project?

How do you get back into a rayce if you have to take a year off?



CONTINUITY – RESOURCE CONCERNS

Is your team expected to end the project revenue neutral? Surplus?

Can your team encumber multi-year financial commitments? Debt?

Is your team expected to pass raw materials or resources to the next team?

CONTINUITY – UMSOLAR EXPERIENCE

CONTINUITY – UMSOLAR EXPERIENCE

Leadership

- Interim USA executive leads (during WSC) selected preceding spring, intern with current execs
- Executive leads are elected by team at end of cycle, usually a mix of returning, former interim, and new leads
- Vacant lead positions are temporarily filled at direction of executives
- Division leads are appointed from the willing and the competent
- Faculty advisers have little involvement with engineering continuity; some involvement with operational continuity.

Teammates

- Strong culture of student org involvement at U-M means we have to actively compete for attention
- Main recruiting occurs during main fall recruiting festival
- No class standing restriction for being on team
- A training (knowledge transfer) plan is established *before* recruiting. Those who show interest after mass meetings advance.
- Veterans are given increasing responsibility, complexity, and autonomy to keep them interested

CONTINUITY - SURPRISE!


●●●●○ AT&T LTE 5:32 PM 19%

Inbox (3)

OFFICE OF
UNDERGRADUATE ADMISSIONS
UNIVERSITY OF MICHIGAN
1220 STUDENT ACTIVITIES BUILDING
515 EAST JEFFERSON STREET
ANN ARBOR, MI 48109-1316

CONGRATULATIONS —You're IN!

You've been admitted to the **University of Michigan College of Engineering for Fall 2015 !**

As a valued member of the freshman class, we're confident you'll continue to shape the tradition of excellence that keeps U-M a step ahead of the rest.

So, how does it feel to be a **Wolverine?**

You'll be receiving your official letter of admission soon. In the meantime, check out www.admissions.umich.edu/theletterm for a special message and begin exploring resources to start your academic career at www.admissions.umich.edu/admitted-students.

Congratulations! Over the weekend, we've turned you all into Wolverines.

We'll go call your old teammates and tell them you won't be coming back.

Take a few minutes to talk with your teammates about:

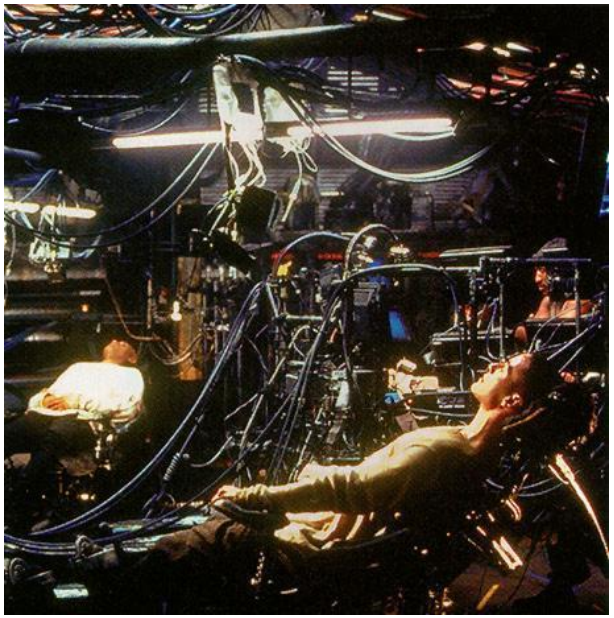
- What your team will be missing without you immediately
- Skills or knowledge that only you have
- What plans you have in place for them to recover

KNOWLEDGE TRANSFER

Who has learned some basics at this Conference?

Who has teammates who have rayced before?

<u>Then why don't you know everything already?</u>



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http://movieimage.tripod.com/matrix/matrix14.jpg

KNOWLEDGE TRANSFER

In a world with perfect knowledge transfer, Solar Car Conferences would just be networking and discussing cutting edge technology.

No team exists in a perfect world.

Better continuity leads to better knowledge transfer

KNOWLEDGE TRANSFER

Types of knowledge to transfer

- Institutional (University)
- Institutional (Team)
- Safety
- Engineering Fundamentals
- Solar Car-specific technical
- Process and Hands-On
- History
- Fundraising/Media
- Organizational/Logistical
- Leadership skills

"Mr. Osborne, may I be excused? My brain is full."
© The Far Side

Some knowledge transfer more applicable to managers than technical membership, and vice versa

KNOWLEDGE TRANSFER - RECRUITS

Step 0: Recruit people to receive this transferred knowledge

- Michigan and Nuon approaches covered during leadership presentation
- Advertising, targeted recruitment, referral by professors, bring a friend, etc…

Team	Enrollment	10	25	50	100
Ecole Montreal	6,900	690	276	138	69
Georgia Tech	21,471	2,147	859	429	215
IL State	20,615	2,062	825	412	206
Kentucky	28,928	2,893	1,157	579	289
Michigan	43,710	4,371	1,748	874	437
Minnesota	48,308	4,831	1,932	966	483
Northwestern	21,596	2,160	864	432	216
Oregon State	27,925	2,793	1,117	559	279
Principia	500	50	20	10	5
SIUE	14,235	1,424	569	285	142
TU Delft	16,500	1,650	660	330	165
UC Berkeley	36,204	3,620	1,448	724	362
UT Austin	52,059	5,206	2,082	1,041	521

For a team size of…

You must recruit and retain 1 in every …

…students at your entire institution

KNOWLEDGE TRANSFER – RECRUITS

When to be looking for / bringing new people on?

- Annually
- Every cycle
- As needed
- Whenever

Fresh onboard, what will the new recruits need to know ASAP?

- Basic institutional knowledge
- Basic technical skills
- Safety
- Basics of Solar Car

How much knowledge people have will depend largely on how you recruit

- Are freshmen allowed to join the team?
- Is prior hands-on experience required?
- Must you know all the technical fields and software to join?

KNOWLEDGE TRANSFER – LEADERSHIP/MGMT

Some fields of knowledge rising leaders or management likely need

- Detailed university institutional knowledge
- Team alumni relations and associated support networks
- Team sponsor relations
- Detailed technical knowledge (esp. for technical leads)
- Project management, timelining, budgeting
- "People skills", personnel management

Questions to Consider

- Do leads need to get this knowledge from hands-on experience, or can they learn from documentation or as-they-go?
- Is there a minimum time period someone must be on the team and demonstrating their basic knowledge before being a lead?

KNOWLEDGE TRANSFER – RAYCE SPECIFIC

Some fields of knowledge likely needed

- Rayce regulations
- Typical rayce expectations
- Procedures for driving safely
- Campsite/food/lodging logistics
- Vehicle outfitting
- Social media/photography/videography

Questions to Consider

- Can you go on a rayce with no experienced raycers?

KNOWLEDGE TRANSFER – MODES

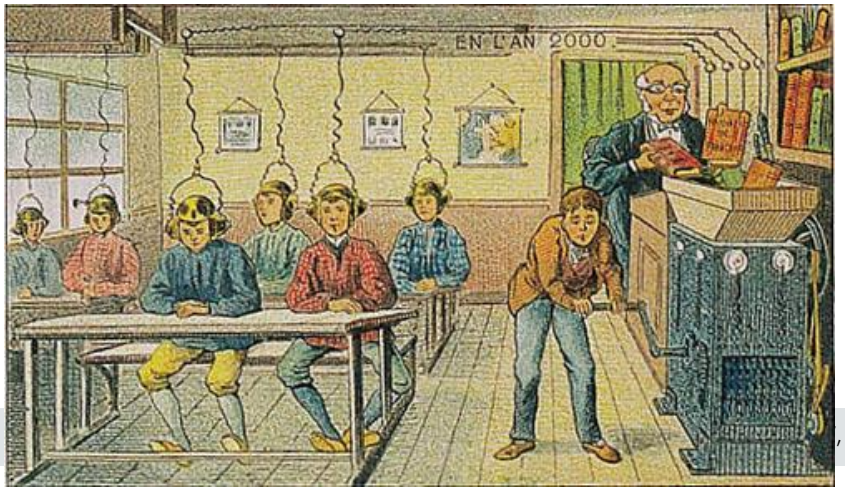
Nobody learns best in one manner – a blend is required

Expect people to come in with knowledge

- Pros: Least amount of work for veterans; recruits can possibly get right to work
- Cons: Harder to find these people; inconsistency in their existing knowledge
- Possible uses: engineering fundamentals; photography/videography

Tell people to learn on their own

- Pros: Almost no work for veterans; helps identify self-motivators early
- Cons: Takes time; no guarantee recruits do it; possibly not effective with very technical or hands-on fields
- Possible uses: dedicated recruits without existing skills; rayce regulations; experimental technologies



https://larrycuban.files.wordpress.com/2015/01/future-classroom-book-woodchipper.jpg

KNOWLEDGE TRANSFER – MODES

Make people read team documentation

- Pros: Little work for veterans; better control of message than telling people to learn on own
- Cons: Requires good documentation set; still requires followup with hands-on processes
- Possible uses: team procedures; team and rayce history

Direct Lecture

- Pro: You have direct control over the message
- Con: Takes up valuable time, for both veterans and recruits; can be a repeat for a lot of material
- Possible uses: Safety knowledge, basic institutional knowledge

Hands-On Instruction

- Pros: Better method for more technical fields; more detailed tailoring of the instruction possible
- Cons: Very time consuming; have to account for varying instruction and learning styles
- Possible uses: team-specific technical skills; software packages

KNOWLEDGE TRANSFER – MODES

Into the Deep End

- Pros: Some people respond well to sink-or-swim; instills a mentality that people have to go out of their way to learn what they need
- Cons: Terrifies some recruits; a lot of hand-holding initially; catastrophic failure an option
- Possible uses: designing parts; sponsor relations; events

Learn-as-you-go

- Pros: Little preparation required; can build on varying levels of existing knowledge
- Cons: Results may vary; requires adaptable and self-motivated recruits
- Possible uses: Mostly same as "Into the Deep End"

Oral History

- Pros: Transfers design intent and overall results very well; sets groundwork for who people should reach out to with questions
- Cons: Instructional quality varies; level of detail varies
- Possible uses: team history; design tips and tricks; rayce experience

KNOWLEDGE TRANSFER – MODES

Hands On/Practicum

- Pros: Keeps practical skills sharp; can be some of the most exciting things to give to new people
- Cons: If trivial, recruits can feel like they're doing busy work; can consume a lot of time and materials
- Possible uses: manufacturing skills; events

Carbon Fiber, a Comprehensive Guide

Chapter 18: Internal ribbing and stiffening.

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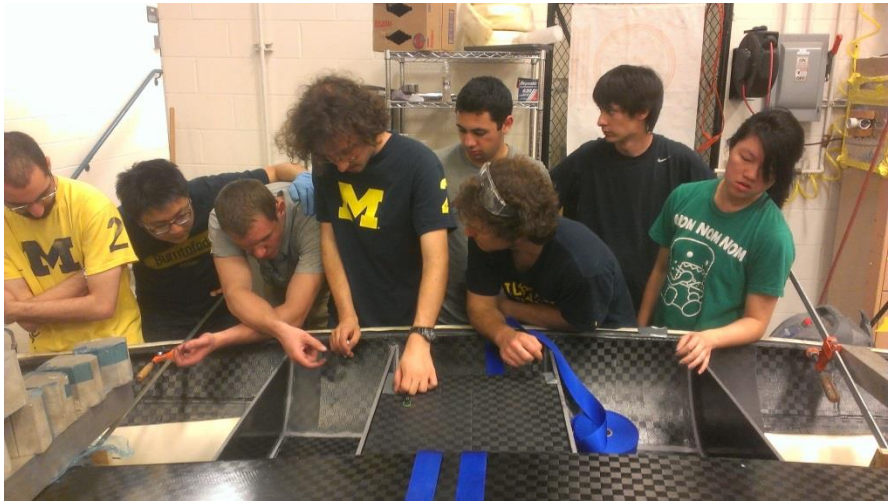


KNOWLEDGE TRANSFER – ACTIVITY TIME!

Take out a half sheet of paper and a writing implement

Write down…

- Two things learned (or thought of) this weekend…
- Two things learned (or thought of) during this session…

…that you want your teammates back home to learn

60 seconds, max

Now, trade with someone from another team, and discuss the differences

Center aisle: hand 'em in

- We'll come back to these in a minute

KNOWLEDGE TRANSFER – KNOW THY AUDIENCE

Those who stay… will transfer the knowledge

- Is what you think you need, as a veteran, the same as what a freshman needs?
- Is what a veteran team wrote the same as what a new team needs?
- What prior knowledge have you assumed when transferring knowledge?
- These factors should be considered when writing documentation

Who is responsible for transferring knowledge?

- Those papers, again
- Everyone is responsible for transferring knowledge

KNOWLEDGE TRANSFER – EXISTING KNOWLEDGE

Special considerations for people who come in with knowledge

- FIRST Robotics; applicable work/internships; generally handy people; etc…

Potential Actions

- Bypass normal knowledge transfer routines to get them doing value-added work ASAP
  - Pro: More work gets done by them; person feels like they're contributing real value sooner
  - Con: Potentially ostracize them to the other folks who have to do more formal learning; expectations and knowledge particulars might differ between them and rest of team; potential god complex
  - Possible applications: "Crap, we're really behind and about to miss critical deadline. Do we have any friends we can call?"
- Subject them to normal knowledge transfer
  - Pro: Greater team cohesion; person can possibly help with knowledge transfer
  - Con: Risk of person growing bored; risk of person trying to contradict leadership prescribed knowledge
  - Possible application: Think an applicant is full of BS; strong team or divisional cohesion is highly valued
- Hybridized Approach
  - Assess their capabilities, have them go through your normal routine at the pace that works for them. Keep their level of challenge the same as other people, which usually means assigning greater challenges
  - Pros: keep divisional cohesion and get to leverage their existing knowledge
  - Cons: requires more active management

KNOWLEDGE TRANSFER – OFF SEASON

What do you do if you're not designing/building a new car, or working on major changes to an existing car?

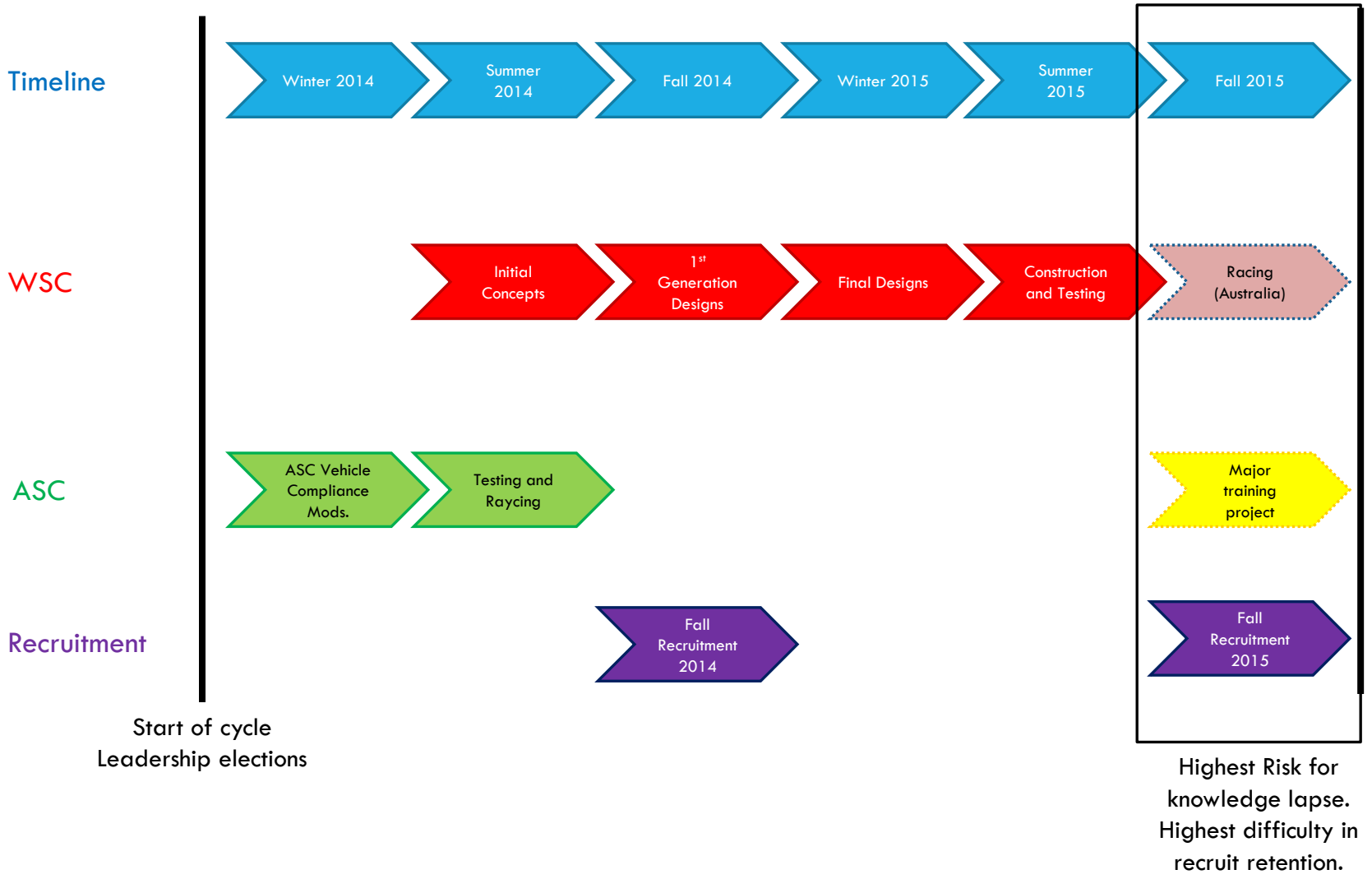
- ASC/WSC only come once every two years.

Missing a year of competition is really rough for keeping up morale, direction, and recruiting

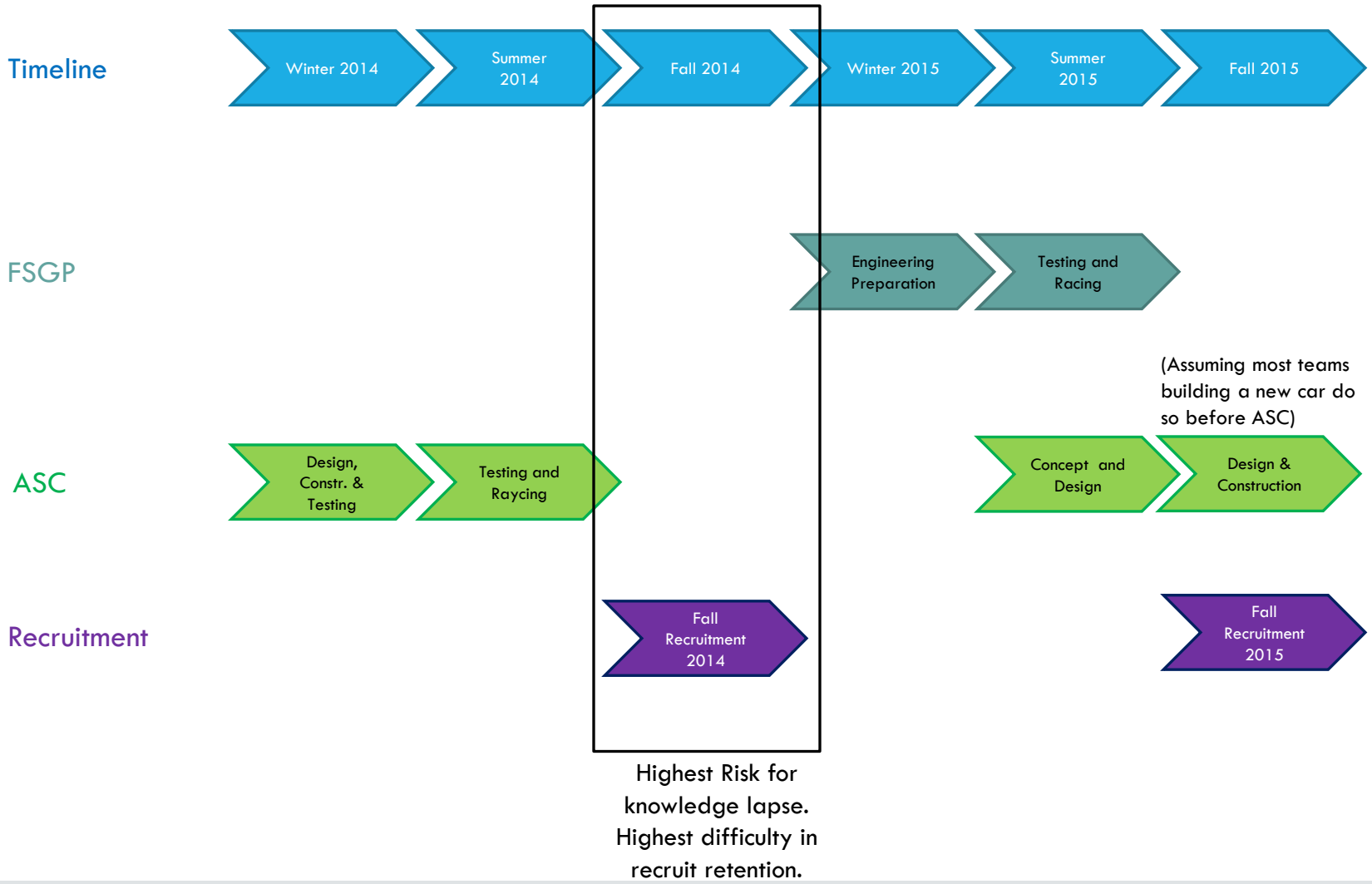
Finding ways to keep engaged in off-years

- Investigation of things to change for new cars, and prototyping as appropriate
- Research projects and demonstration pieces for new technologies
- Mule car - build a chassis box for testing suspension, propulsion, and electronics (eg: HANK)
- Modifications to existing car to enter into a different race, off-season race, or race for which it was not designed.
- Teaching/learning/training new members so less work is required for this during design years
- Off season competitions (or adding yourself a season) an option, though requires a lot of people, organization, and fundraising

UMSOLAR TYPICAL TWO-YEAR CYCLE



ASC/FSGP ORIENTED TIMELINE



KNOWLEDGE TRANSFER – UMSOLAR EXPERIENCE

Finding Candidate Team Members

- Recruit at mass festivals in fall
- Hold mass meetings

Hooking Candidate Team Members

- Open houses
- Show a variety of the team's work and what people might do

People join initially

- Declare which division they want to work on
- Perform initial training and work with that division. Limited availability to transfer after this

KNOWLEDGE TRANSFER – UMSOLAR EXPERIENCE

Technical Fundamentals

- Generally expect people to come in with the skills or learn them on their own
- Hold review sessions at beginning of recruitment so people learn what they don't know
- Screen people from advancing in training process with a quiz on fundamentals
  - Also a good way to suggest people move between divisions

Solar Car General Knowledge

- Initial meetings stress team culture, expectations, basic history
- Everyone expected to read rayce regulations
- Screen people from advancing in training process with a quiz

Process Fundamentals

- Generally don't expect people to know our software
- Manufacturing experience is desired, but not required
- Combination of web tutorials and group instruction for software

KNOWLEDGE TRANSFER – UMSOLAR EXPERIENCE

University Institutional Knowledge / Safety

- Access to our shop requires safety training by U-M staff
- Two 1-hour sessions, with an assigned project afterwards
- Training covers basic safety and reporting
- Must pass through training to advance on team

Machining processes

- Some people come in with them
- Most mechanical engineers learn them through undergraduate design & manufacturing curriculum
- Using machines in our shared shop requires additional training by U-M staff

KNOWLEDGE TRANSFER – UMSOLAR EXPERIENCE

Project Experience

- Once through initial training, recruits work in small teams on technical projects
- Redesign of existing part, solving a small design challenge, etc…
- Expected to leverage skills learned, and go out and learn more
- Continued involvement on team dependent on how well they do here

Hands-On Experience

- Practice layups
- Assembling/disassembling car
- Off-year: occasionally, mule car

KNOWLEDGE TRANSFER – UMSOLAR EXPERIENCE

Design Reviews

- Have our alumni look over proposed designs and calculations
- Get torn to shreds
- Alumni willing to have followup phone calls with applicable team members
- Iterate

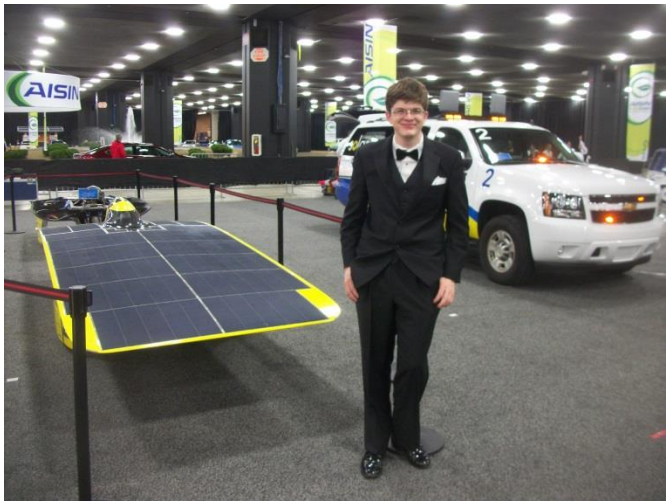
KNOWLEDGE TRANSFER – UMSOLAR EXPERIENCE

Fundraising

- Recruits shown existing pitches, and make a few of their own with direction.
- Moved on to real pitches, starting with small companies and cold contacts. Events: people on the events crew get thrown headfirst into tailgate and alumni events in the fall. Give them a book of FAQ and event etiquette, and send one veteran to run the event. Have them follow suit.

Events

- Fall football tailgate appearances: throw new people in to sink-or-swim
- Auto Show: planned by recruits, overseen by veterans. Staffed by entire team.



KNOWLEDGE TRANSFER – UMSOLAR EXPERIENCE

Photography, videography, graphic design

- Generally only accept people who come in with the skills
- Occasionally have motivated, awesome candidates learn the skills to keep them around and racing. However, professional quality work ONLY comes with practice
- Have contracted this out before

Oral History

- Retreat
- Bonding events
- Auto Show
- Leadership retreat
- Alumni retreat

KNOWLEDGE TRANSFER – YOU!

You've learned a lot this weekend – now your team needs to know!

Take a minute to talk with your team about how you'll teach this weekend to your team.

Share – what are your three biggest takeaways?

DOCUMENTATION

http://www.hotelservicepro.org/wp-content/uploads/2013/10/Paperwork-Help.jpg

DOCUMENTATION

Who had better documentation from the knowledge transfer exercise – the person who wrote in 60 seconds, or the person taking notes the entire lecture?

Documentation is several things

- Necessary for proving safety to enter rayces
- A tool used during design reviews
- A method for debriefing
- A means to an end for Knowledge Transfer

DOCUMENTATION

When to write documentation

- Meeting Agendas (before) and Meeting Minutes (after)
- Before sponsor interactions (agenda) and after (postmortem, action items, status of relationship)
- As required by event organizers
- Leading up to your design reviews, to capture both the process of design decisions as well as the design intent
- Immediately before a race event, to capture your understanding of all preparations that have been made and intended race strategy and operation
- Immediately after a race event, to capture how things actually worked
- Whenever you learn something you're going to forget, or that you think next year should know

https://c2.staticflickr.com/4/3953/15309909208_5b692474b2.jpg

DOCUMENTATION

What to capture in documentation

- Design decisions
- Actions taken
- Results - what happened?
- Photos and Text
- Sponsor relations
- Timelines, hierarchies, and relationships
- Original (source) files
- Process

DOCUMENTATION

Motivation to Write Documentation

- Engrain in team culture
- Fear, Long Term: Don't write, we'll fail (or won't qualify)
- Fear, short term: Don't write, and you're fired (or else have nothing else to do)
- Hope: Write, and we'll survive in the future!
- Guilt: Everyone else wrote theirs…

Where to Keep Documentation

- Team-controlled servers
- Hardcopy in team office spaces
- Cloud-based drive storage
- Specialized database
- THINK CONTINUITY! How will storage be passed along?

Who gets Documentation?

- Up to you, and to the occasion
- Team members, alumni, sponsors, officials, nobody, etc…

DOCUMENTATION – FORMAL, WRITTEN

You were probably thinking formal written documentation, weren't you?

Nothing wrong with formal reports

- Make the storage location consistent
- Make the naming consistent
- Make them searchable, and include SEO-type keywords

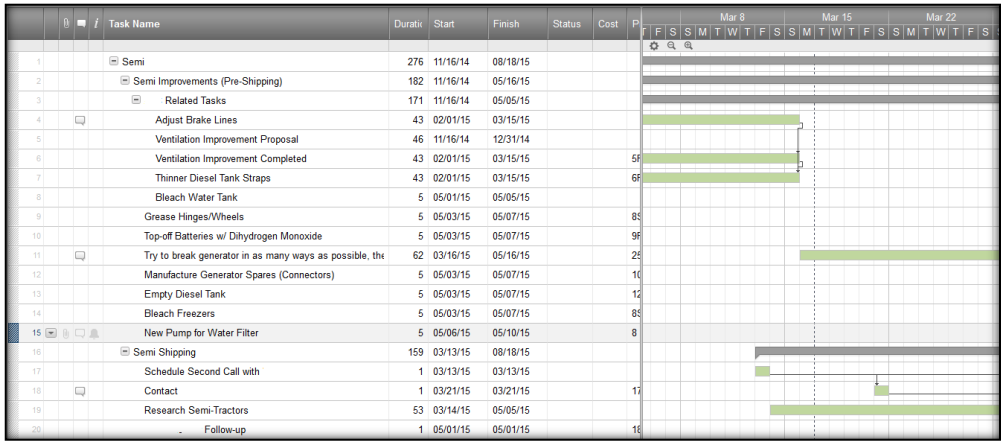

University of Michigan solarcar

Mechanical 2014 Pre-Summer Design Review

4/12/14

Preston Strauch	Mech Lead	strauchp@umich.edu
Darren Cheng	Brake Pedal	dacheng@umich.edu
Ishi Keenum	Four Wheel Steering	ikeenum@umich.edu
Jack Hu	In-Hub Suspension	hujack@umich.edu
Jacob Kirschner	Mule Chassis	jmkirsch@umich.edu
Jake Fratzke	Mule Chassis	jfratz@umich.edu
Khai Yi Chin	Parking Brake	khaiyi@umich.edu
Mitchell Opanasenko	Four Wheel Steering	opmitche@umich.edu
Ted Xiao	In-Hub Suspension	oaix@umich.edu
Terris Lo	Four Wheel Steering	terrislo@umich.edu
Xiang Zhang	Trailing/Leading Arm Suspension	zhaxiang@umich.edu

Ford NYK Line Michigan Engineering QATAR AIRWAYS IMRA GM SIEMENS


	Task Name	Duratic	Start	Finish	Status	Cost	P
1	Semi	276	11/16/14	08/18/15			
2	Semi Improvements (Pre-Shipping)	182	11/16/14	05/16/15			
3	Related Tasks	171	11/16/14	05/05/15			
4	Adjust Brake Lines	43	02/01/15	03/15/15			
5	Ventilation Improvement Proposal	46	11/16/14	12/31/14			
6	Ventilation Improvement Completed	43	02/01/15	03/15/15			5F
7	Thinner Diesel Tank Straps	43	02/01/15	03/15/15			6F
8	Bleach Water Tank	5	05/01/15	05/05/15			
9	Grease Hinges/Wheels	5	05/03/15	05/07/15			8S
10	Top-off Batteries w/ Dihydrogen Monoxide	5	05/03/15	05/07/15			9F
11	Try to break generator in as many ways as possible, the	62	03/16/15	05/16/15			2S
12	Manufacture Generator Spares (Connectors)	5	05/03/15	05/07/15			10
13	Empty Diesel Tank	5	05/03/15	05/07/15			12
14	Bleach Freezers	5	05/03/15	05/07/15			8S
15	New Pump for Water Filter	5	05/06/15	05/10/15			8
16	Semi Shipping	159	03/13/15	08/18/15			
17	Schedule Second Call with	1	03/13/15	03/13/15			
18	Contact	1	03/21/15	03/21/15			17
19	Research Semi-Tractors	53	03/14/15	05/05/15			
20	Follow-up	1	05/01/15	05/01/15			18

Mar 8 Mar 15 Mar 22

DOCUMENTATION – DAILY WRITTEN

Meeting Minutes

- Leadership meetings
- General team meetings
- Sponsor interactions

Other Tools

- CRM Software – tracking sponsor interactions
- Wiki
- Team website
- Blog
- Daily diary
- Running list of things that come to mind

DOCUMENTATION - OTHER

Photos

- A picture is worth 1000 words – an overused adage which we believe
- Photos of process
- Photos of day-to-day activities with date in metadata
- Photos of mundane things
- Photos of your team!

Video

- Updates
- Instructional

Artifacts

- Samples of team work and process
- Notable pieces of history

DOCUMENTATION – UMSOLAR EXPERIENCE

Sponsor Relations

- Open-source CRM Server

Code (Firmware, software, strategic)

- Git Server
- Subversion Server

CAD Modeling

- Active development: data and design intent captured in Siemens TeamCenter
- Archival: FTP Server

Design Review Materials

- Prepared in advance of each design review
- Archived on our servers and distributed digitally to invited alumni and sponsor reviewers
- Proceedings of design reviews held in team Google Drive

DOCUMENTATION – UMSOLAR EXPERIENCE

Leadership Meetings

- Agendas and minutes stored on team Google Drive

Testing

- Testing plans documented in hardcopy and archived in office.
- Pre-testing checklists performed in hardcopy, and archived in office.

Overall Project Documentation

- Keep a running list of things to document
- Post-design documentation due before building begins
- Race crew owes main documentation set before race departure
- Additional race-specific documentation due after race
- Debrief event held for new/returning team members to discuss documentation

DOCUMENTATION – YOU!

How will you document this weekend?

How will you save the knowledge from this weekend for the generations to find?

Can you think of any creative documentation methods?

Anything cool in mind?

TAKEAWAY POINTS

Continuity

- Means ensuring your team survives you
- Requires active planning on your part
- Also requires work by the new generation
- Better continuity leads to better knowledge transfer

Knowledge Transfer

- There are multiple methods – mix them up to find what works for you
- Investment in your team members is required
- Know your audience, and work to it
- Importance of practical and hands-on experience during off-season

Documentation

- Documentation is a means to an end, but not the only means
- When it doubt, document it
- Store it logically, permanently, searchable
- Be creative!

THANKS!

Some things on Solar Car seem impossible…

← Egress time for a 6’2” driver: 02:30

Pass egress? X

… Continuity, Knowledge Transfer, and Documentation aren’t!