

Proving Something Big

# Improving Construction Productivity: Time & Motion



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ENERGY LTD.

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School of Engineering



CENTRE FOR  
PROJECT MANAGEMENT EXCELLENCE

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# Forward-looking statements

This Laricina Energy Ltd. (the “Company”) presentation contains certain forward-looking statements. Forward-looking statements may include, but are not limited to, statements concerning estimates of exploitable original-bitumen-in-place, predicted recovery factors, steam-to-oil ratios and well production rates, estimated recoverable resources as defined below, expected regulatory filing, review and approval dates, construction and start-up timelines and schedules, company project potential production volumes as well as comparisons to other projects, statements relating to the continued overall advancement of the Company’s projects, comparisons of recoverable resources to other oil sands projects, estimated relative supply costs, potential cost reductions, recovery and production increases resulting from the application of new technology and recovery schemes, estimates of carbon sequestration capacity, costs for carbon capture and sequestration and possible implementation schedule for carbon capture and sequestration processes or related emissions mitigation or reduction scheme and other statements which are not historical facts. You are cautioned not to place undue reliance on any forward-looking statements as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. By their nature forward-looking statements involve numerous assumptions, known and unknown risks and uncertainties, both generally and specific, that contribute to the possibility that the predictions, forecasts, projections and other forward-looking statements will not occur. Although the Company believes that the expectations represented by such forward-looking statements are reasonable, there can be no assurance that such expectations will prove to be correct and, accordingly that actual results will be consistent with the forward-looking statements. Some of the risks and other factors that could cause results to differ materially from those expressed in the forward-looking statements contained in this presentation include, but are not limited to geological conditions relating to the Company’s properties, the impact of regulatory changes especially as such relate to royalties, taxation and environmental changes, the impact of technology on operations and processes and the performance of new technology expected to be applied or utilized by the Company; labour shortages; supply and demand metrics for oil and natural gas; the impact of pipeline capacity, upgrading capacity and refinery demand; general economic business and market conditions and such other risks and uncertainties described from time to time in the reports and filings made with security regulatory authorities, contained in other disclosure documents or otherwise provided by the Company. Furthermore the forward-looking statements contained in this presentation are made as of the date hereof. Unless required by law the Company does not undertake any obligation to update publicly or to revise any of the included forward-looking statements, whether as a result of new information, future events or otherwise. The forward-looking statements contained in this presentation are expressly qualified by this advisory and disclaimer.



# Outline



# Introduction

- **It is said that oil sands projects are not executed that efficiently:**  
  
“ ...the performance and improvement in construction ***productivity has been declining*** over the past 20 years<sup>1</sup>. The decline in Alberta is consistent with the ***decline of productivity in North America*** over the past three decades<sup>2,3</sup> .”

1.- Choy, E.C.Y. (2004). “Modeling Construction Site Productivity using situation-based simulation tool.”

2.- Business Roundtable (BRT), 1989; Dozzi and AbouRizk, 1993; Hewage and Ruwanpura, 2006; Sharpe, 2006.

3.- Jergeas, G & Alberta Economic Development (2009).” Improving Construction Productivity on Alberta Oil & Gas Projects

# Introduction

- **Effective work time, or ‘Tool-time’ is lower than that of commercial construction projects:**

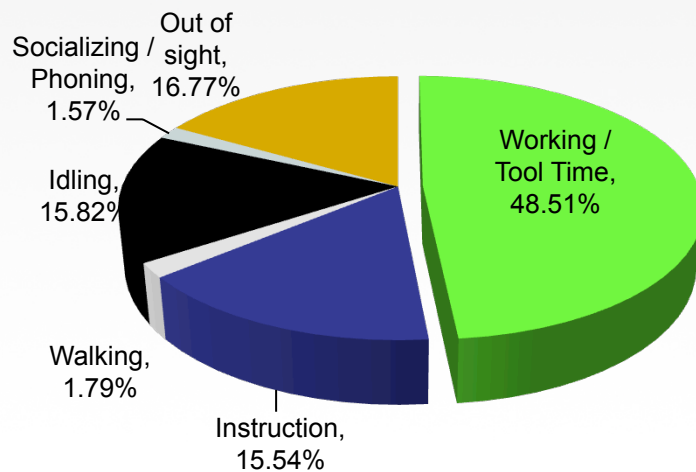


Figure 1: Commercial construction<sup>1</sup>

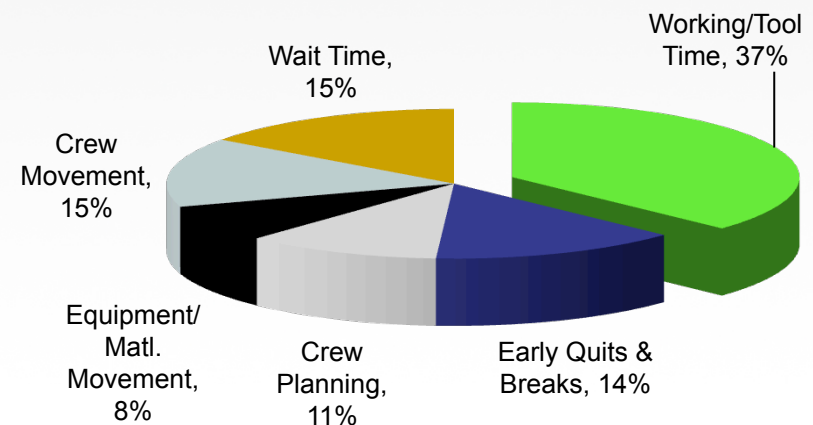


Figure 2: Oil sands<sup>2</sup>

- **Random improvements based on experience are not enough...**

1.- University of Calgary(2008)

2.- Construction Owners Association of Alberta (COAA) – Source unknown



# Improve productivity, an industry challenge

## Laricina is advancing *innovation project execution strategies*



- **Facility construction is capital intensive.**



- **Labour is a key component**
- **Any efficiency obtained means significant cost savings**
- **Estimates up to 9% reduction in TIC/CAPEX<sup>1)</sup>**

\*Images from Laricina Energy Ltd website, [www.laricinaenergy.com](http://www.laricinaenergy.com)

1.- Cusitar, W. (2009). "Project Planning: A case study. COAA Workface Planning Conference



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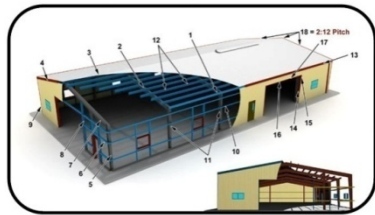
# Improve productivity, an industry challenge



- Objectives:
  - Measure and verify current productivity
  - Improve productivity levels

# Improve productivity, an industry challenge

- Challenges remain in identifying specific issues affecting productivity at all levels



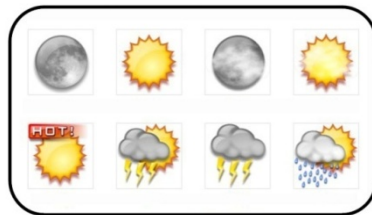
Technical



Management



Human/Labour



External factors



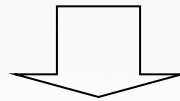
Market Conditions



# How can we improve productivity?

## **Time & Motion:**

A Time & Motion (T&M) study is a business efficiency technique that observes the time and methods (motions) to perform any type of work<sup>1</sup>.



***STEP 1: Monitor construction activities and site operations***

***STEP 2: Identify inefficiencies and opportunities***

***STEP 3: Implement changes***

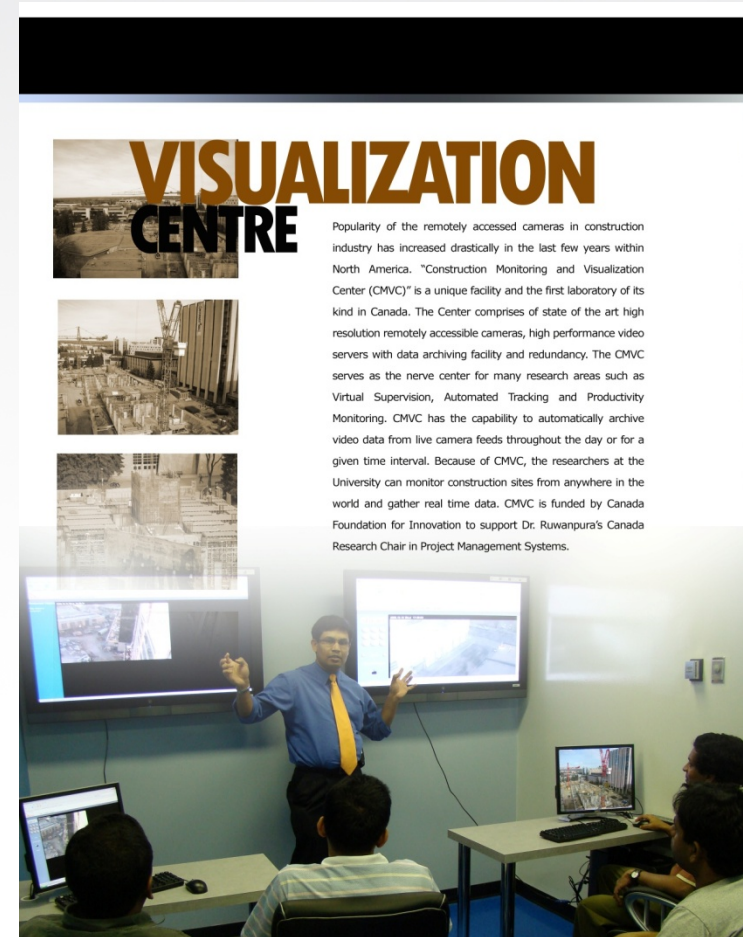
***STEP 4: Quantify the impact***

1.- Archives from Frederick W. Taylor and Frank and Lilian Gilbreth.



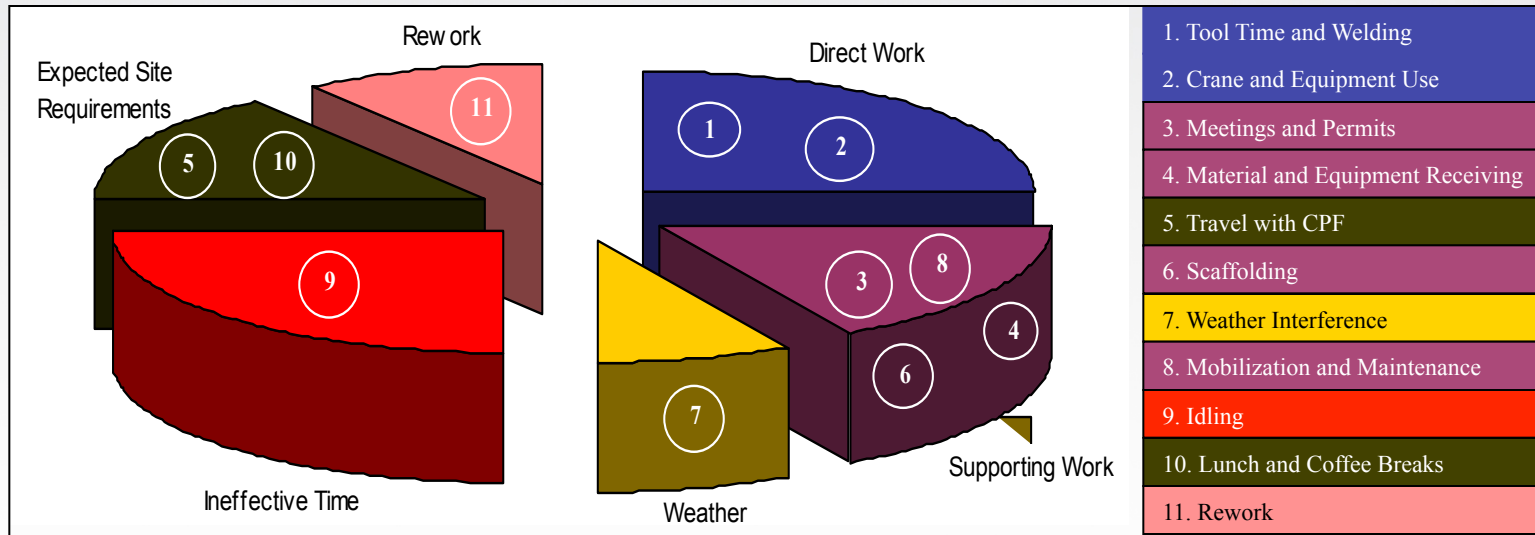
# Time & Motion study

- Modern model for T&M: Remotely controlled video cameras, accessed exclusively by third party researcher
- Privacy protection is a must
- Laricina has partnered with the University of Calgary's Centre for Project Management Excellence:
  - Canada Research Chair Dr. Janaka Ruwanpura and researchers (Chandana Siriwardana)
  - Construction Visualization and Monitoring Centre(CMVC)



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# Time & Motion study



## What is Tool Time?

- The amount of time that workers spend in producing tangible outputs

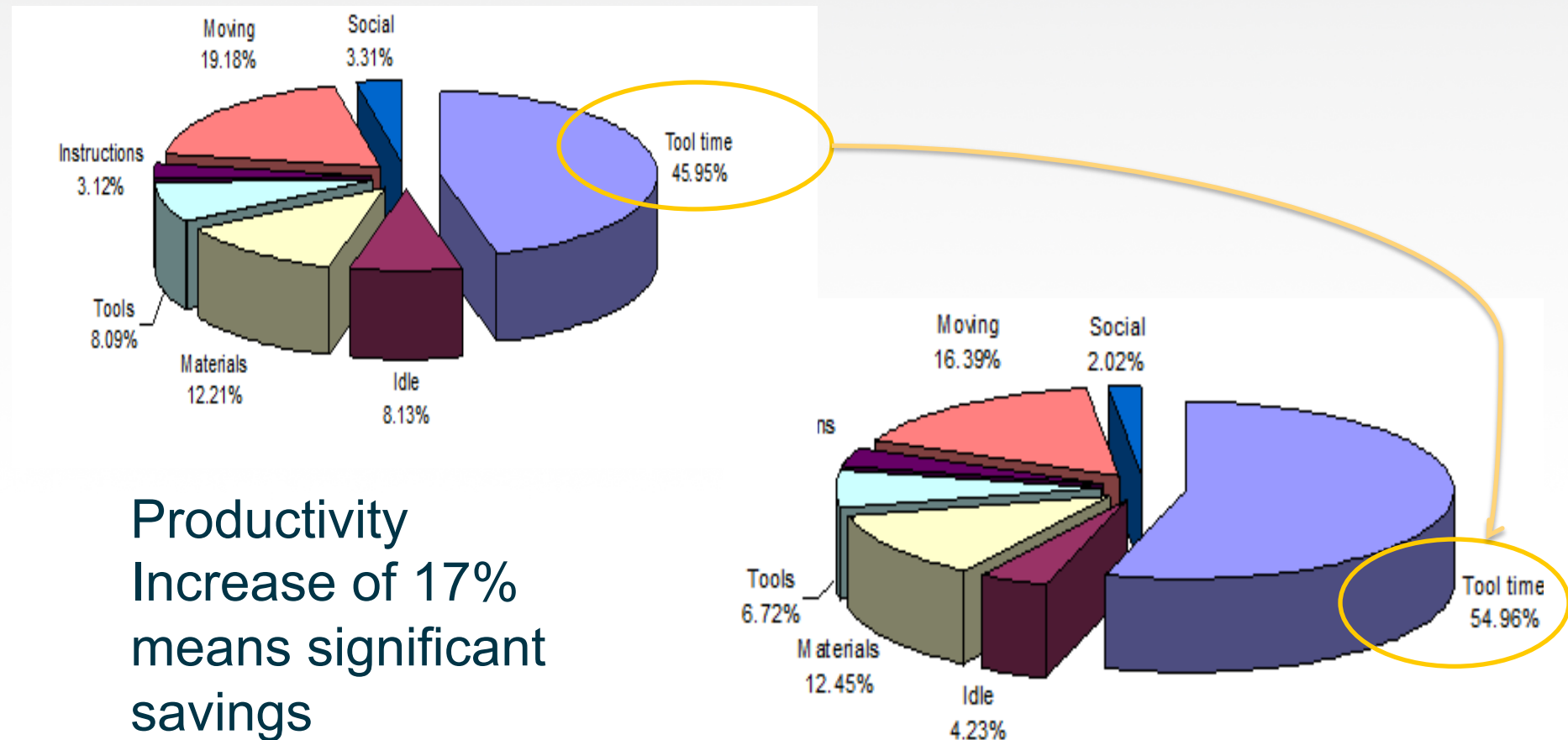
## Non-Tool Time

- Supporting Time: discussions, toolbox meetings, safety etc.
- Ineffective Time: idle time, extra-socializing, searching for tools and materials



# Opportunities (something big)

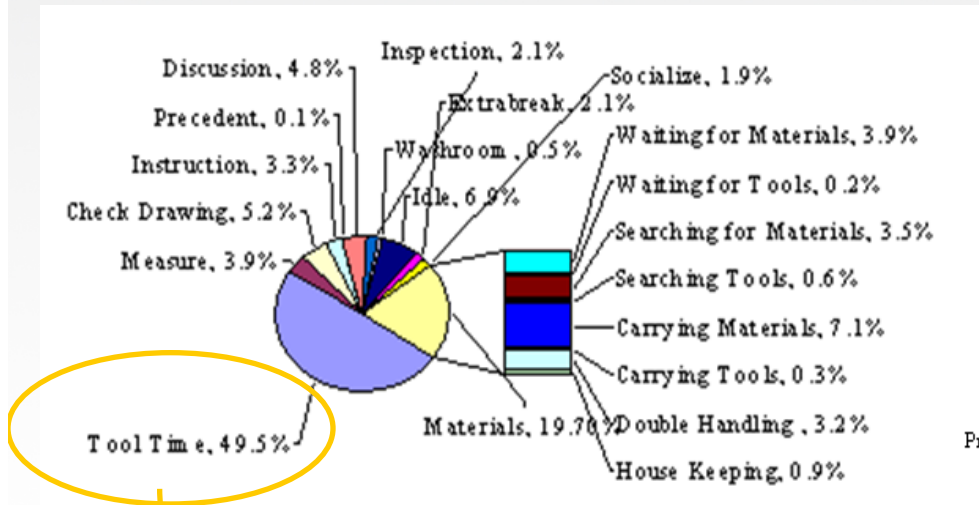
- Example 1: Applying just one process change...



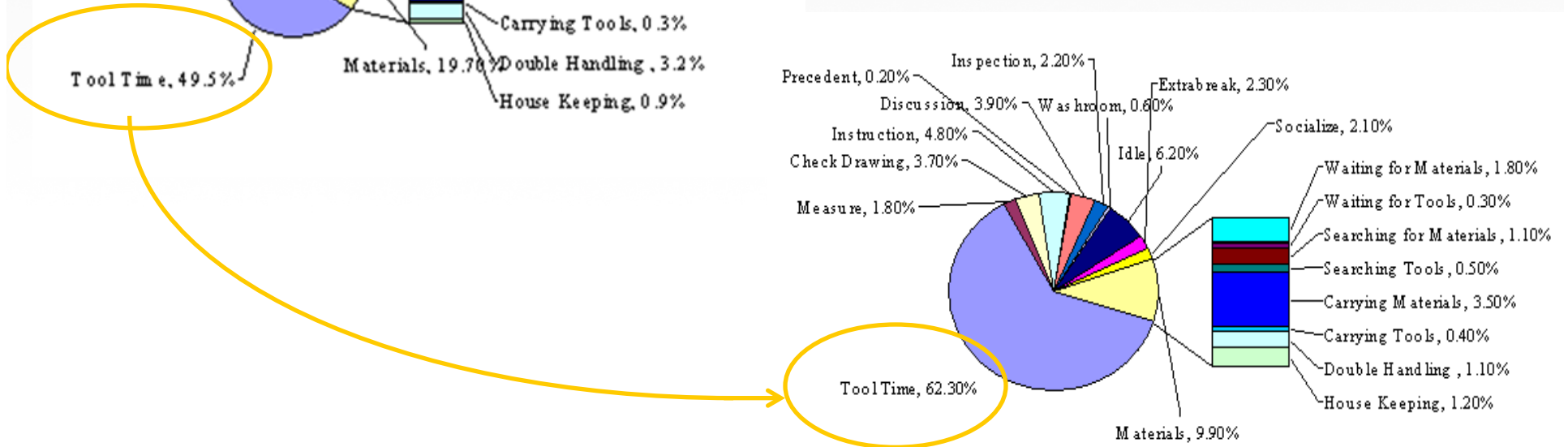
\* University of Calgary(2004-2008). Results observed in Commercial construction Projects

# Opportunities (something big)

- Example 2: Applying a set of new processes



Productivity Increase of 20% means even greater potential savings



\* University of Calgary(2004-2008). Results observed in Commercial construction Projects



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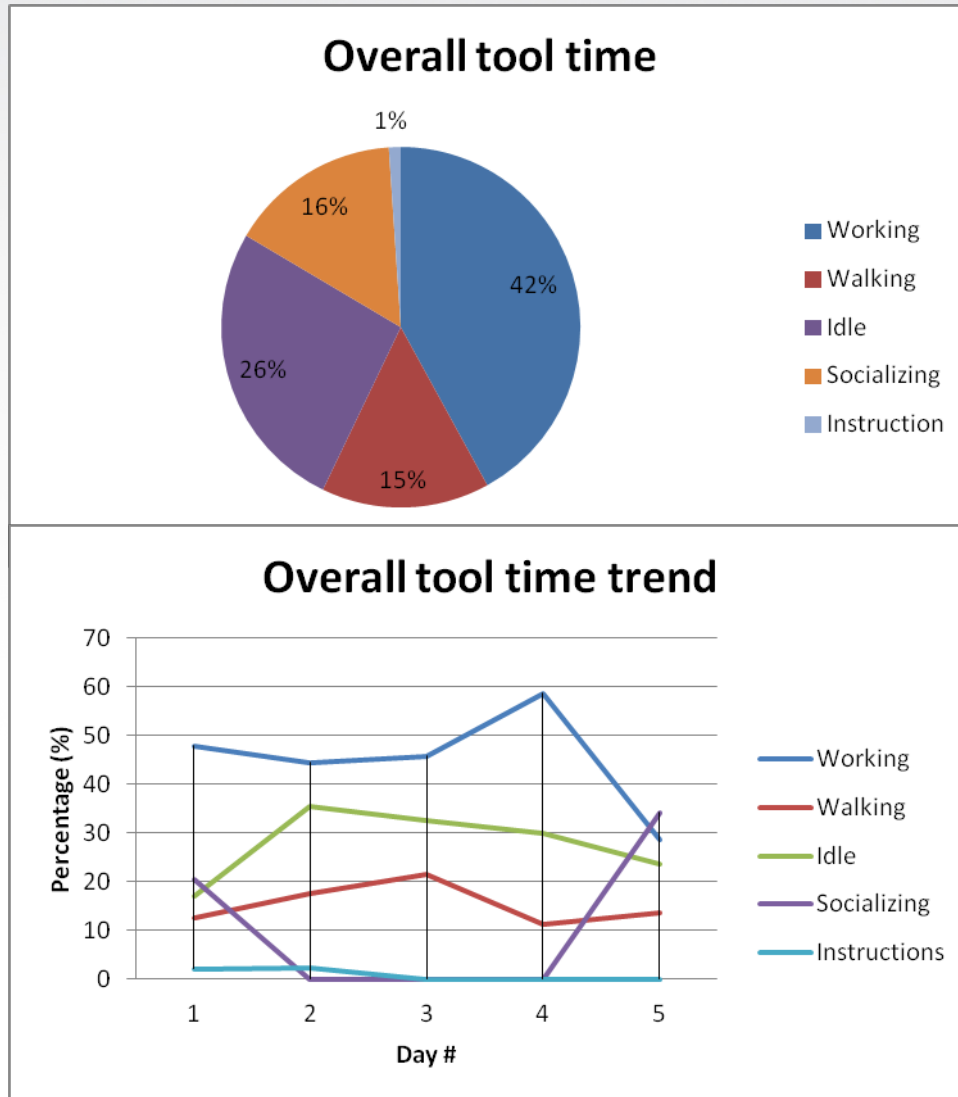
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## Sneak Peek: Actual Data Analysis

# Data and analysis (different days)

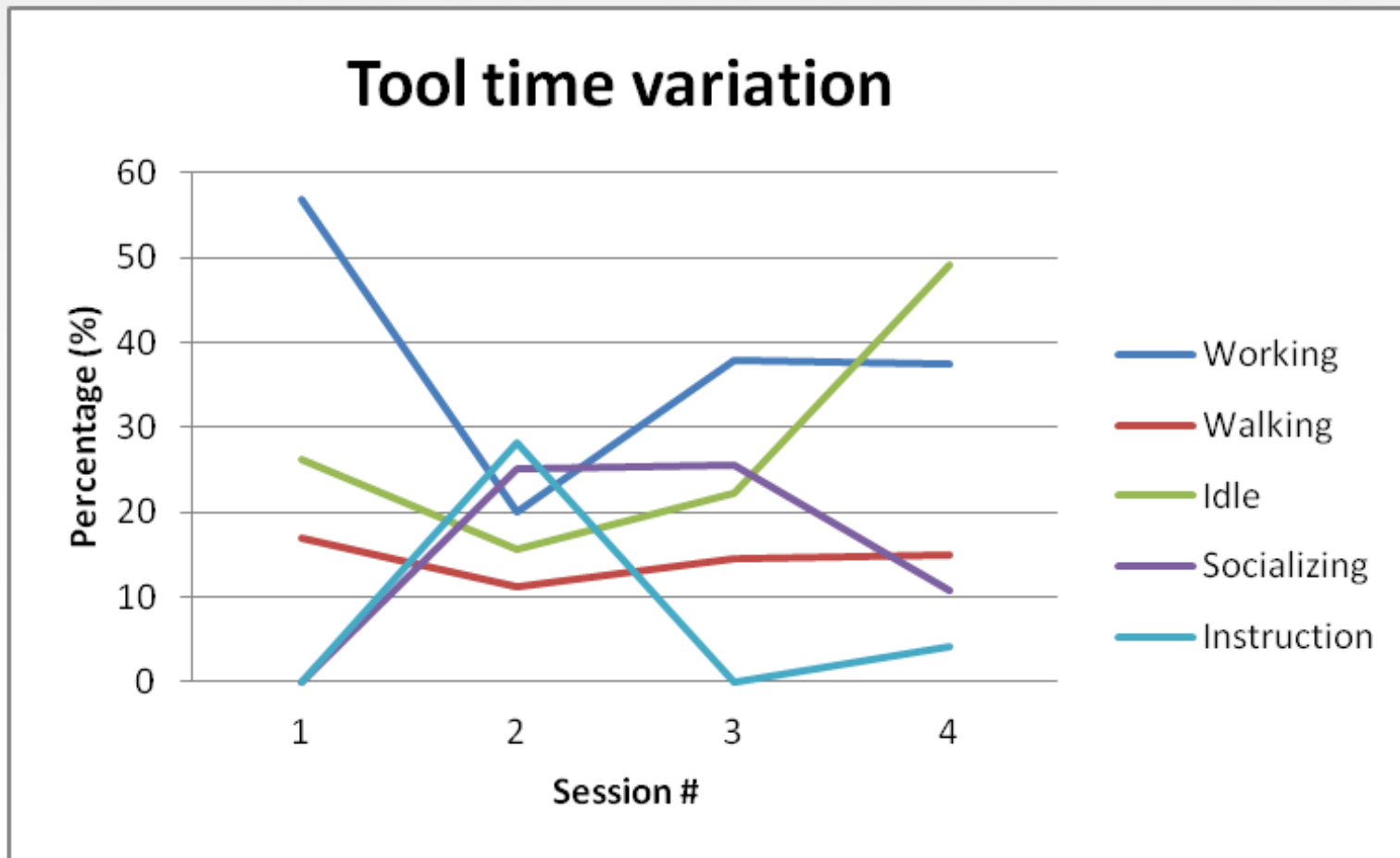


## Observations

- High idling time
- Socializing and walking times are comparatively similar
- Average tool time of the 3rd day morning session and 4th day afternoon session taken for the calculation



# Data and analysis (during the day)



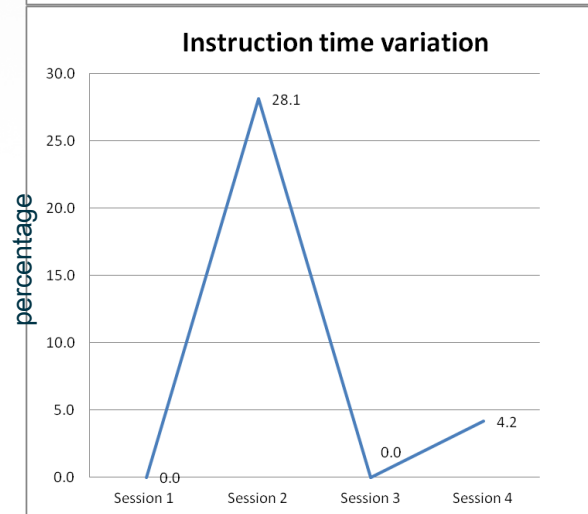
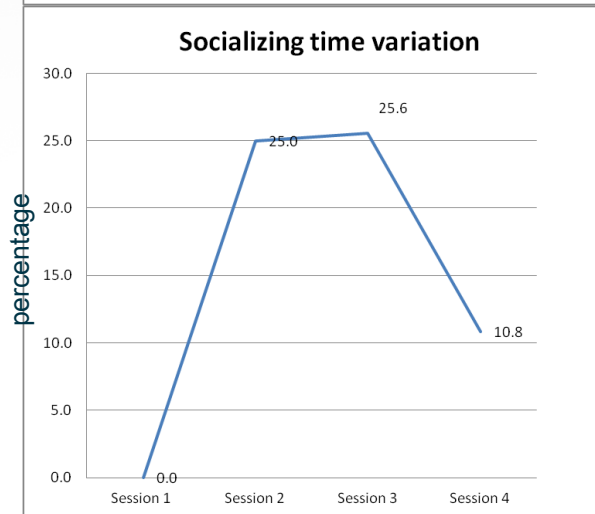
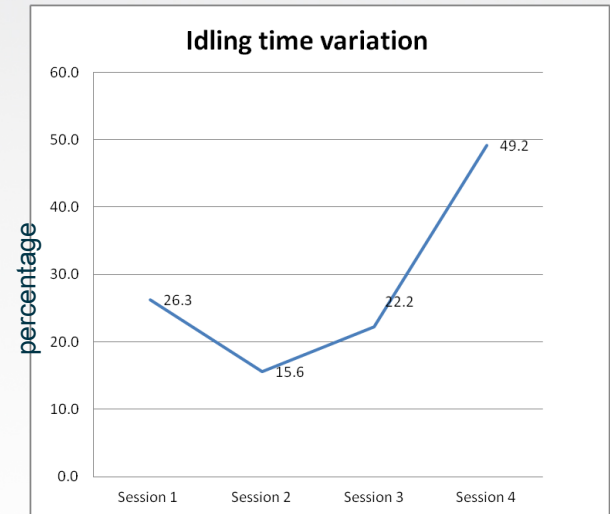
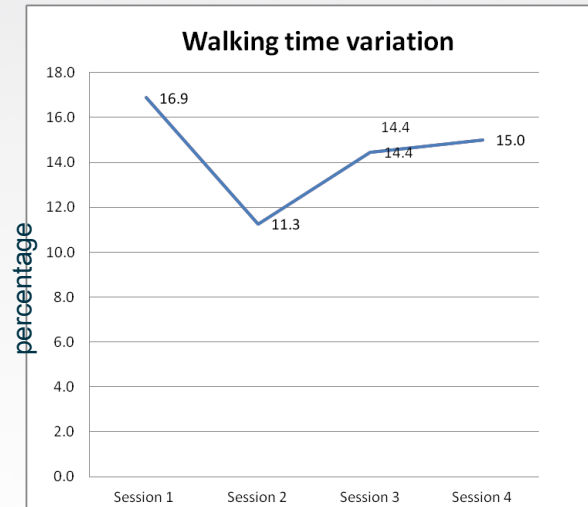
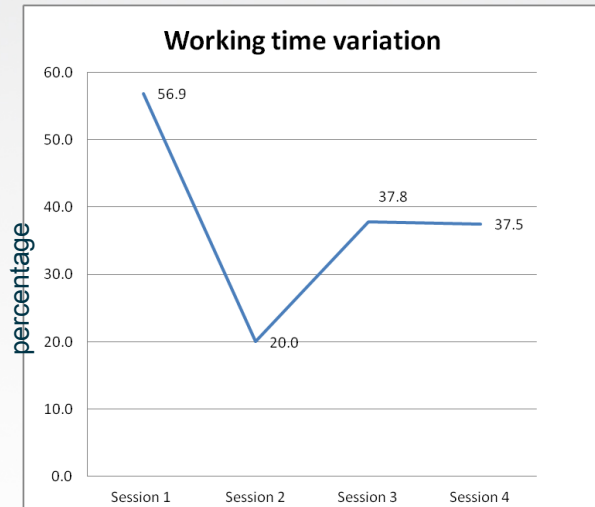
\* Session are different times during the day



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# Tool time variation (during the day)



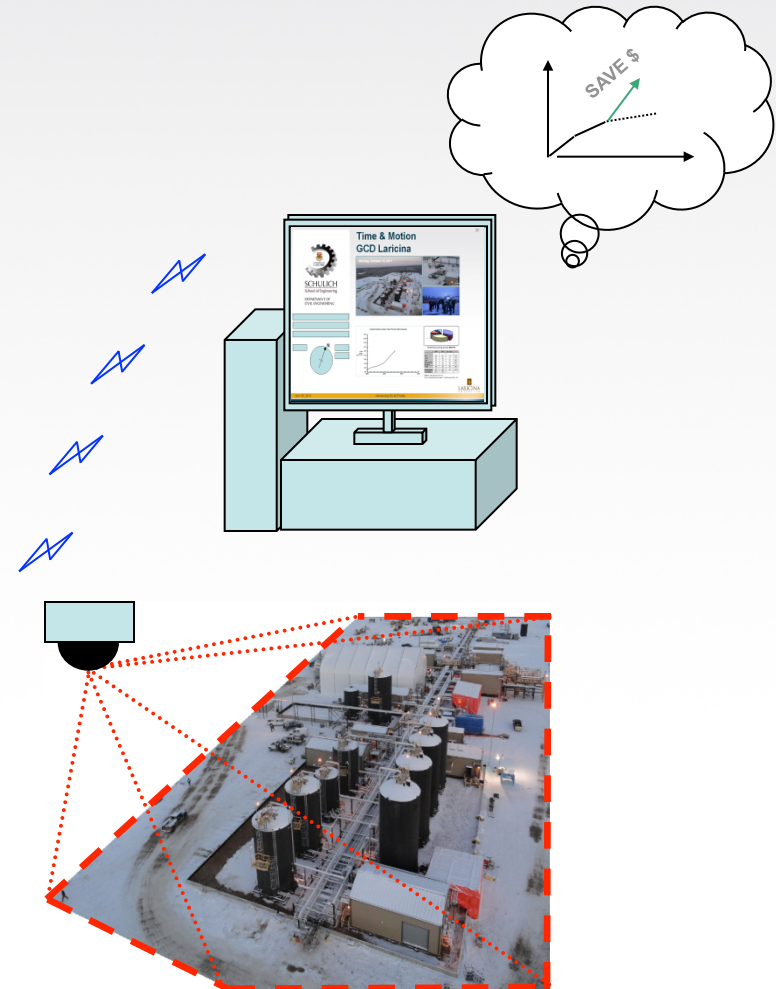
# Benefits

- ***Learning and Teamwork:*** Participants (Laricina, contractors and workers) can learn more about the project execution and how they function as a team
- ***Real-time improvements:*** Tool for site management to improve in real-time and capture lessons learned
- Contractors improve and are recognized for achievements (and ***become industry leaders***)
- ***Cost-Schedule-Quality :*** T&M partners realize immediate improvements



# Next Steps

- ***Laricina continues to pioneer with UofC:***
  - Early stage; collecting and validating the data. This is the first time using this model in the industry
  - This innovation is setting a precedent for industry Tool time,
  - Ability to implement change is the next challenge.
- ***Change practices in field:***
  - We are going to improve our practices, continue to observe and quantify these gains.



**Questions?**



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