RESEARCH PMO
BROWN BAG LUNCH

Breaking Down the Work

September 29TH, 2022 @ 11:30am – 1pm

PRESENTED BY:
Research PMO
Strategy Integration

Children's Hospital of Philadelphia
RESEARCH INSTITUTE

WHY ARE WE ALL HERE?

Today's Session will cover:

- Key concepts and techniques for Work Breakdown Structure (WBS)
- Requirements gathering best practices
- Defining appropriate work levels

We give examples of how WBS can be used in agile methodology and provide examples for applying WBS when developing research projects.

AGENDA FOR TODAY'S WEBINAR:

- Housekeeping
- Introductions
- What do we mean by breaking down work?
- Requirements gathering and best practices
- Work Breakdown Structure within Agile practices
- Work Breakdown Structure within Research
- Final Questions/Surveys
- Takeaways/Resources/Tools

HOUSEKEEPING

What to keep in mind for today's webinar:

- We encourage everyone to turn their camera on to increase engagement

- Everyone is muted, if you have a question or comment, please:
  - Type your question in the Chat Box
  - Ask a question using the Raise Hand function
  - If un-mute, please state your name and title/department

- Slides/webinar materials will be shared post-session

- The Research PMO values your opinions & feedback:
  - Please complete our post-session survey

INTRODUCTIONS – RESEARCH PMO AND STRATEGY INTEGRATION

RESEARCH PMO OVERVIEW

Our Vision

"In support of Research Administration, we will plan and execute small, medium, and large projects, programs, or process improvement initiatives. Our management approach will assess your goals and objectives and develop a plan that best suits your needs."

Services Provided:

- Advisory, Audit, and Governance solutions
- Project Mgmt. and Business Analyst Resources
- Process Improvement and Change Management
- Project Management Education
- Project Management Tools and Templates

STRATEGY INTEGRATION OVERVIEW

Our Vision

To drive alignment between CHOP's strategic priorities and the operational actions that contribute to achieving those priorities

Services Provided:

- Business process improvement
- Business consulting
- Program Management
- Project Management

WHAT DO WE MEAN BY BREAKING DOWN WORK?

Work Breakdown Structure

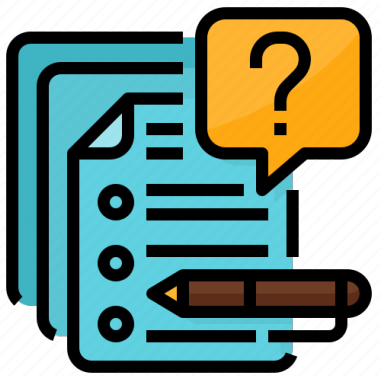
A deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required ***deliverable****.*

What are you delivering?

- Decomposing your scope into manageable components
- This is a process to understand these components better
- The processes should be a predecessor of resource needs, budget, and schedule
- Depending on situation and timing it can also help refine your scope

QUIZ TIME

Please respond to the poll requests



Children's Hospital of Philadelphia
RESEARCH INSTITUTE

WBS IN CONTEXT

Work Breakdown Structure (Process by traditional definition)

- Decomposition of the project scope
- Visualizes the project
- Subdivide the project work
- Creates required deliverables

The importance, is in the **process**. Going through the **practice** of decomposing your work.

Work Breakdown Structure (In Practice process)

All the above, plus…

- Schedule
- Activity list
- Reporting data
- Status tracker

The **output** of this process will create the ability to plan & track your work more accurately – including schedules and resource needs

WBS STARTS WITH DELIVERABLE THINKING

THINGS WE DELIVER, ACTIONS WE TAKE

- **Deliverables** – Collection of completed "things" that make up the entire scope.
  - Change Management
  - Stems from objectives and/or goals
- **Tasks** – The actions taken to complete the deliverable
  - Starts with a verb
  - More adaptive

WHERE TO START?

Your scope defined by deliverables

- What deliverables (things, outputs) will result in a completed scope?
- What needs to be accomplished to call a deliverable complete?
  - Do we need to break this down into sub-deliverables?
- What other are considerations (risks, internal/external environmental factors) on course to complete of each deliverable?

Requirements Gathering…

REQUIREMENTS GATHERING

Characteristics

- Requirements must be measurable and testable
- It must **answer questions** like how much?
  - How many? And how well?
- It must also be **testable** so there's an objective way to verify it.
  - If a requirement is testable, you can verify whether it has been met.

REQUIREMENTS GATHERING TYPES AND PROCESSES

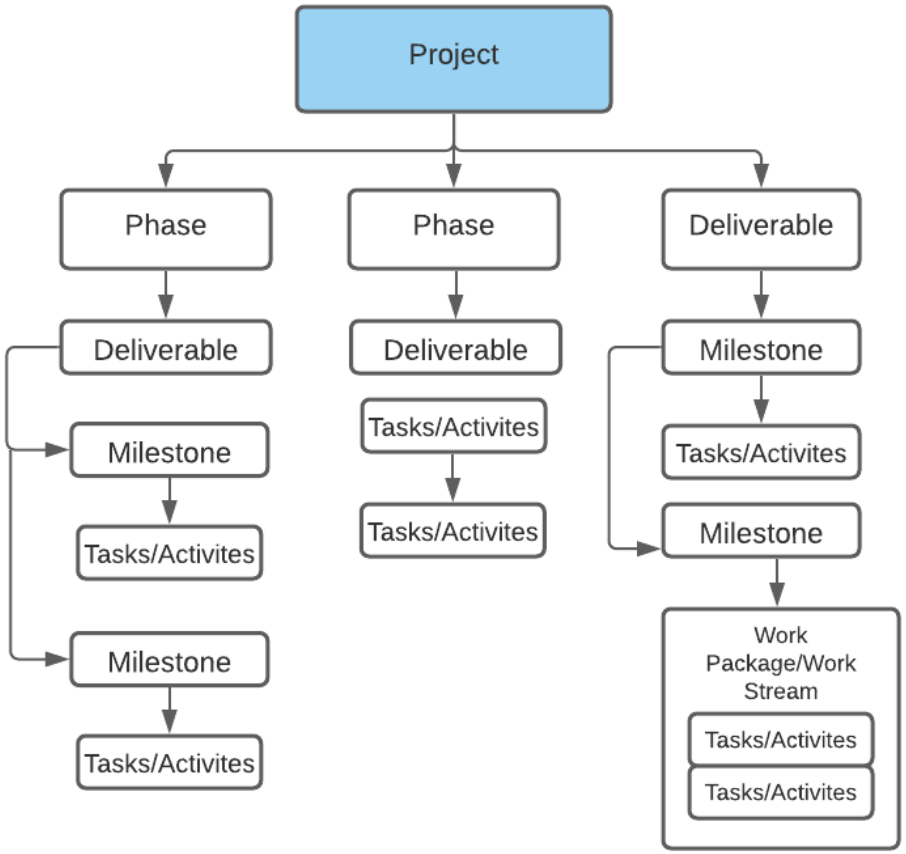
Types of Requirement Gathering

- Data gathering
- Expert judgement
- Data Analysis
- Decision Making

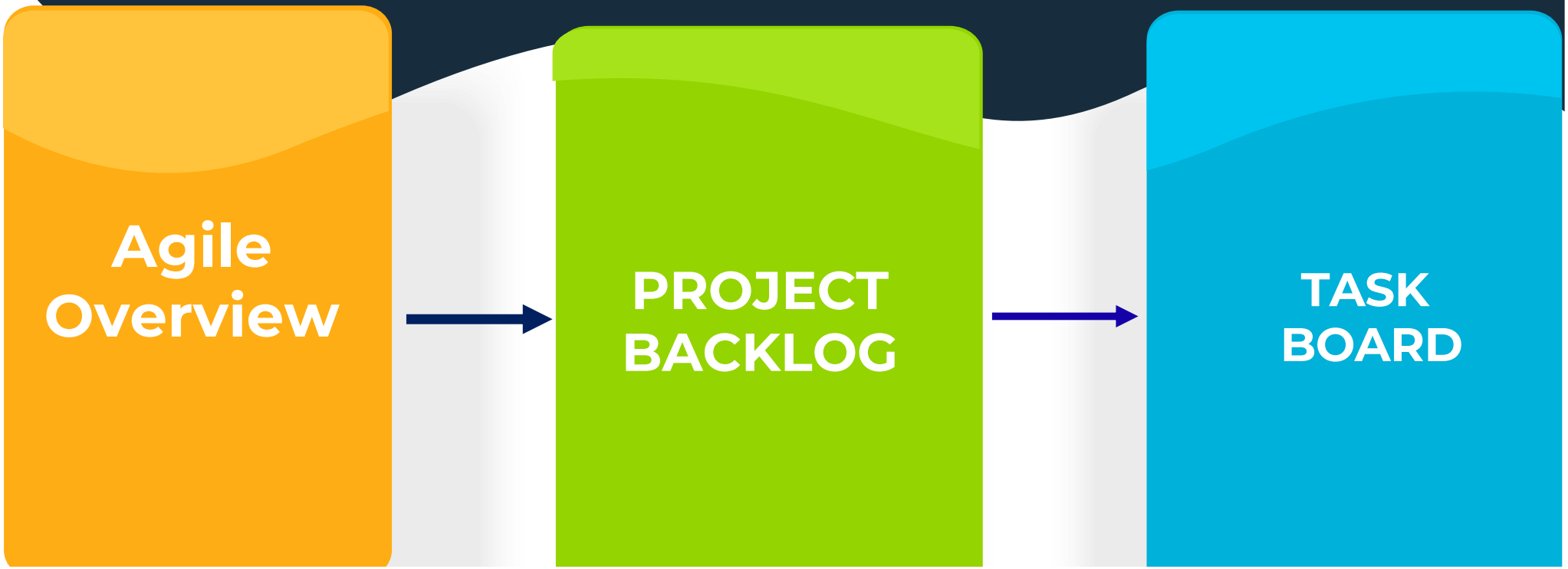
Examples of Process

- Interview
- Focus group
- Brainstorming session
- Questionnaire/Survey

WBS DIAGRAM - WATERFALL



WORK BREAKDOWN STRUCTURE WITHIN AGILE PRACTICES



AGILE OVERVIEW

- It is an iterative approach to project planning and management.
- It divides project processes into pieces and completes them in smaller phases called sprints.
- Agile projects are completed in small sections.

PROJECT BACKLOG OVERVIEW

- A list of all desired work on the project “The requirements”
- Owned, managed and prioritized by the project team
- Re-prioritized at the start of each iteration
- Ideally expressed such that each item has value to the users or customers of the project

Project Backlog

Most ready for implementation

Least ready for implementation

Project backlog Items
(e.g., epics, features, Stories, and tasks

Ordered based on a combination of:

- Business / Mission Value
- Cost / Size
- Time Criticality
- Technical Dependencies
- Risk Reduction / Opportunity Enablement

Project Backlog Item ordering

PROJECT BACKLOG ITEMS (PBIs)

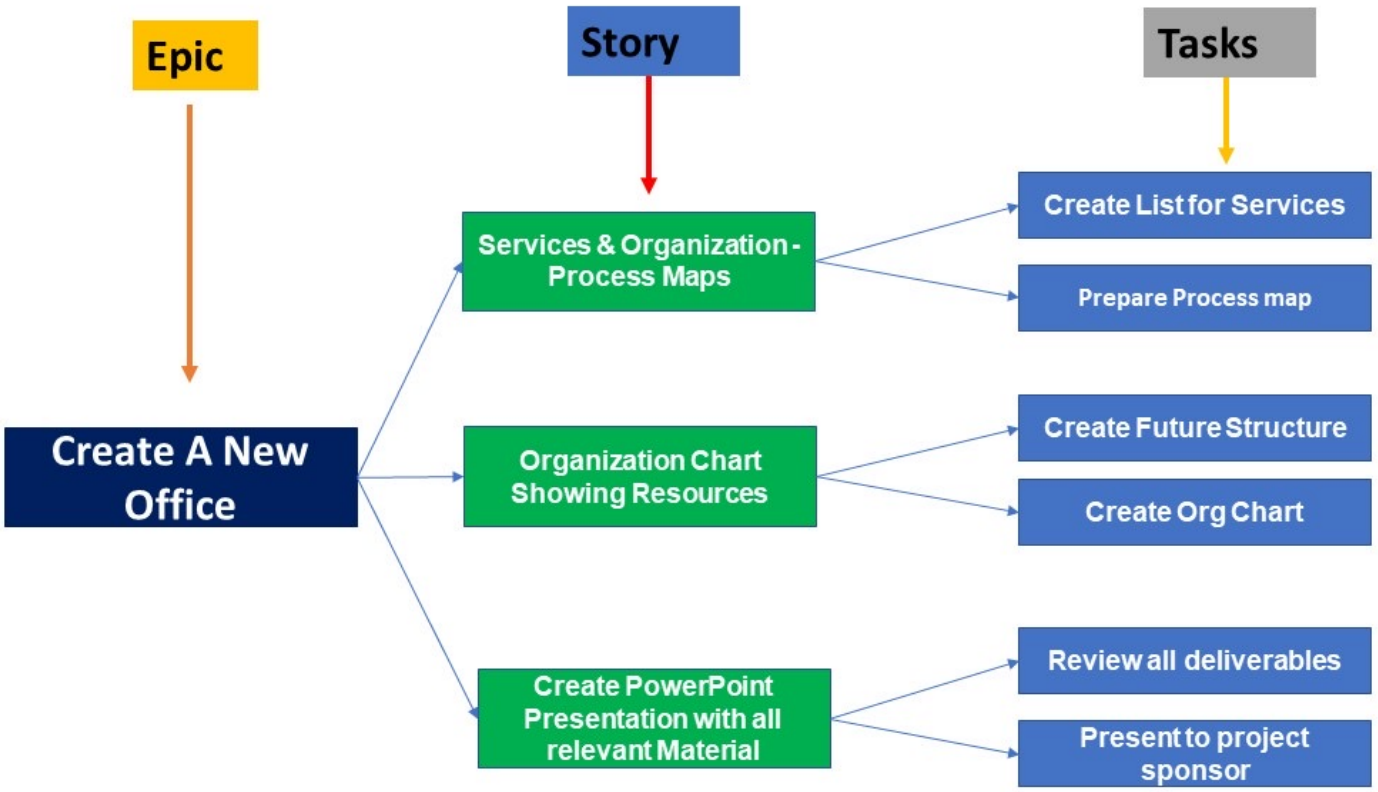
- **Epic → Features → Stories → Tasks**

- **Epic** – High level business requirements
  - **Features** – Small aspect of an epic
    - **User story** – Small aspect of a feature
      - **Task** – Small aspect of a user story

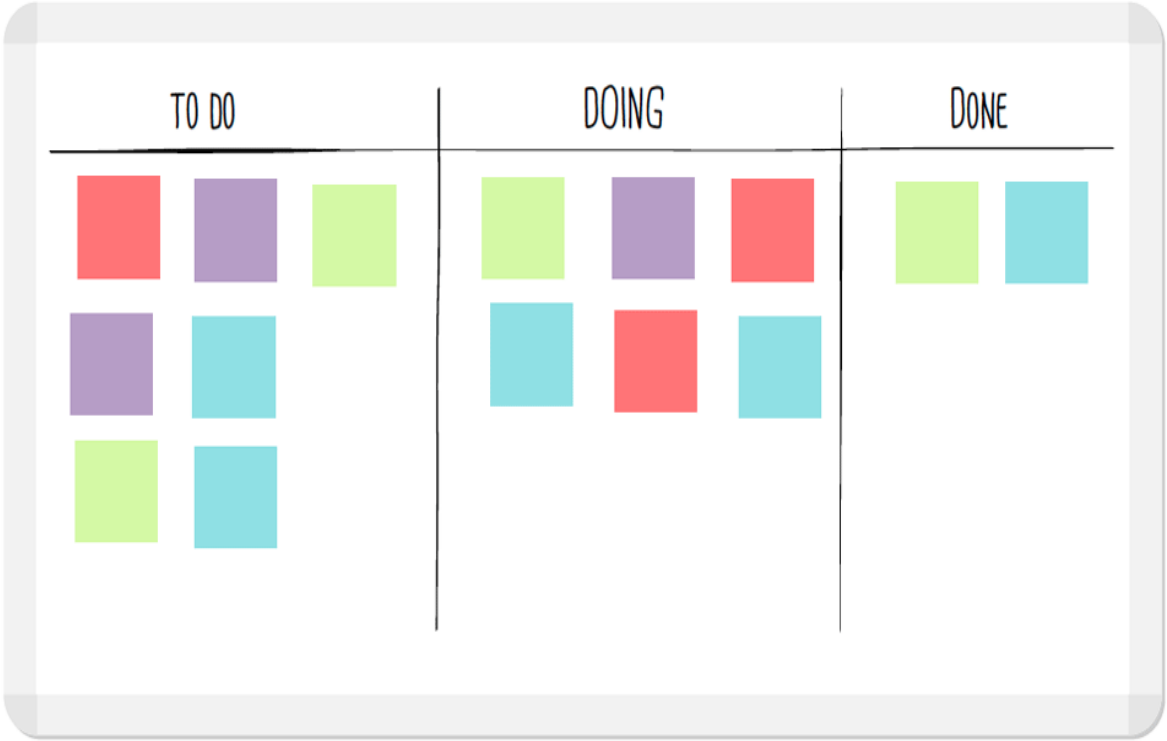
BREAKING IT DOWN

An epic is a large body of work that can be broken down into a number of smaller stories.

Example of an Epic



TASK BOARD/KANBAN BOARD



- It helps visualize work
- limit work-in-progress
- Maximize efficiency (or flow)

QUIZ TIME

Please respond to the poll requests

Children's Hospital of Philadelphia
RESEARCH INSTITUTE

HOW TO CHOOSE A METHODOLOGY

	Why to consider	Why not to consider	Research Application Example
Waterfall	• Straight forward • Well documented • Mapped out upfront	• Changes have effects • Must know a lot upfront • Not easily scalable	Grant or funding submission Key feature: Set deadlines and requirements
Agile	• Embraces Change • Builds upon accomplishments • Quick turnaround	• Discipline scope management needed • Planning will be variable and iterative	Research Project Setup Key Feature: Question/Observation based with iterative planning based on answers and needs
Hybrid	• Works best with ranging deliverables or phases • Allows to adjust based on needs	• Ambiguity in planning/execution for teams • Reporting challenges	Writing of findings/Paper Writing Key Features: Set hard deadlines and upfront planning but allow portions of the work to be more iterative as it proceeds

QUIZ TIME

Please respond to the poll requests

Children's Hospital of Philadelphia
RESEARCH INSTITUTE

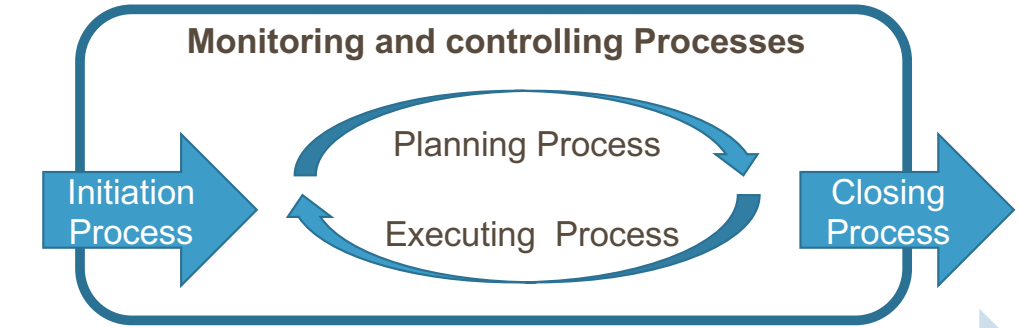
HOW CAN WBS BE USED IN A SCIENTIFIC SETTING?

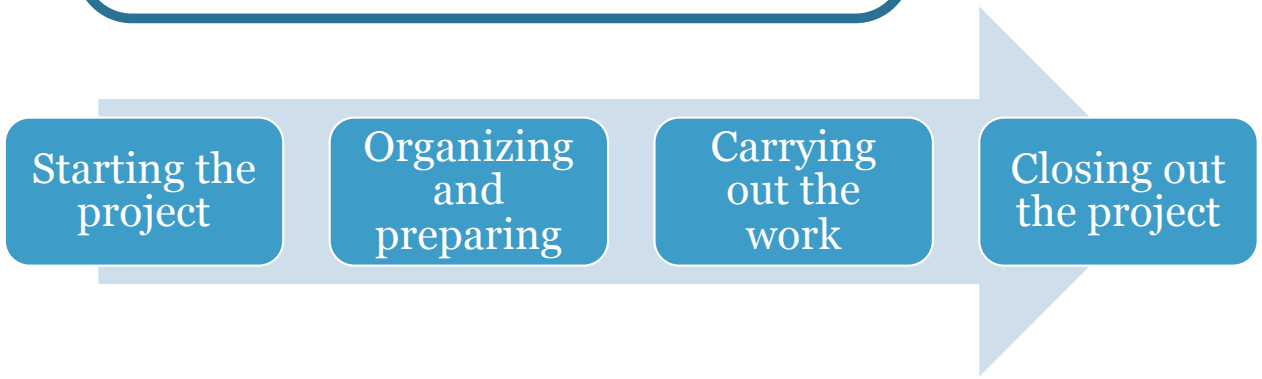
Research requires many commitments:

- Drafting literature reviews
- Writing grants
- Managing study logistics
- Analyzing data
- Writing manuscripts

WBS is a formal hierarchical tool designed to build tangible work-product. It is used to outline all the work that will have to be performed in a project and helps reduce wasted effort.

WBS IN MANAGING CLINICAL RESEARCH

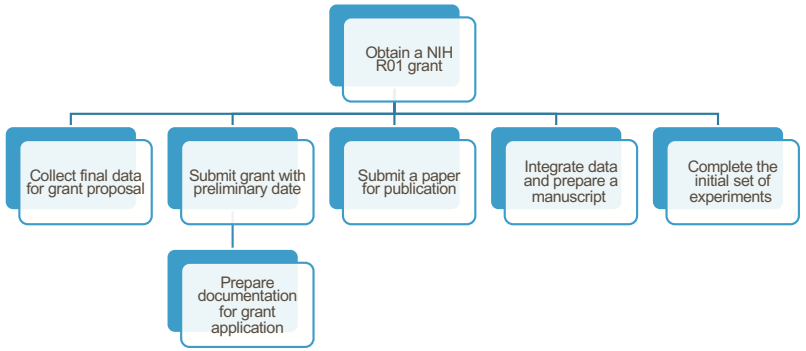




- Agile may be a good approach
- Throughout the project lifecycle you may cycle back from the executing process to the planning process
  - In the organizing and preparing phase you may need to modify existing plans to address problems you encounter
  - Alternatively, you may need to address new information you acquire while carrying out the project work

WBS IN GRANT PREPARATION

Milestones	WBS	Deliverables	Task Name	Actual Start Date	Actual End Date	Duration	Predecess...
☐	**1**	★	**Obtain a NIH R01 grant**				
☐	**1.1**	★	**Obtain final data for grant proposal**	**09/01/22**	**06/01/23**	**196d**	
☐	**1.2**	★	**Submit grant with preliminary data**	**06/02/23**	**02/02/24**	**176d**	**2**
☐	1.2.1	☆	Prepare documentation for grant application	06/02/23	02/02/24	176d	
☐	1.2.1.1	☆	Research Plan	06/02/23	02/02/24	176d	
☐	1.2.1.2	☆	Progress Report (preliminary results and demonstration of relevant expertise)	06/02/23	02/02/24	176d	
☐	1.2.1.3	☆	Research Design and Methods	06/02/23	02/02/24	176d	
☐	1.2.1.4	☆	Resources and Facilities	06/02/23	02/02/24	176d	
☐	1.2.1.5	☆	Budget	06/02/23	02/02/24	176d	
☐	1.2.1.6	☆	Budget Justification	06/02/23	02/02/24	176d	
☐	**1.3**	★	**Submit a paper for publication**	**06/02/23**	**11/03/23**	**111d**	**2**
☐	**1.4**	★	**Integrate data and start writing a manuscript**	**11/06/23**	**04/08/24**	**111d**	**11**
☐	**1.5**	★	**Complete the initial set of experiments**	**11/07/22**	**01/06/23**	**45d**	



WBS IN MANAGING RESEARCH PROJECTS

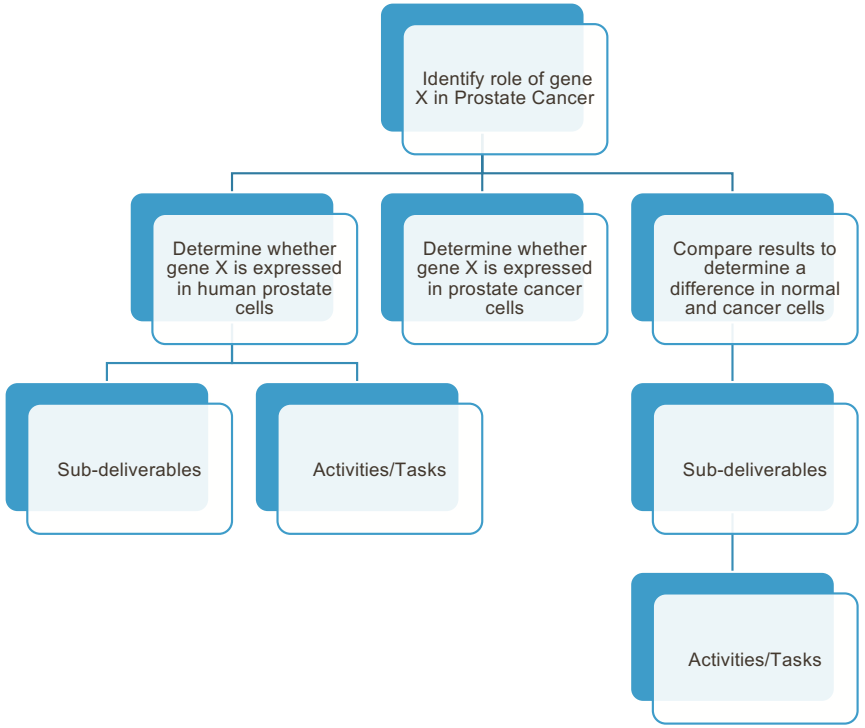
Background

A postdoc in the laboratory, Alicia, wants to explore the role for changes in gene X in prostate cancer. She noted that gene X encodes a growth factor receptor that maps to a genetic region involved in human prostate cancer. Current studies in the lab focuses on role of gene X in brain tumors.

Waterfall, Agile, or Hybrid?

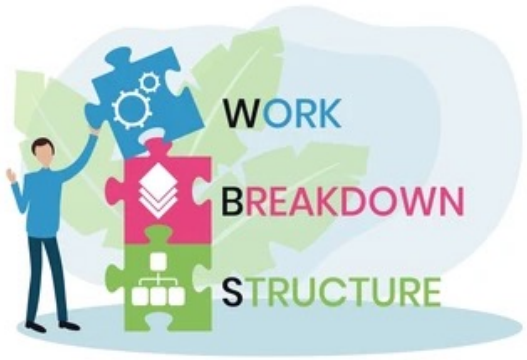
Milesto...	WBS	Deliver...	Task Name	Actual Start Date	Actual End Date	Duration	Predecess...
	1	★	**Identify the role of gene X in Prostate Cancer**				
	1.1	★	**Discover/Establish Association of gene X in normal prostate cells**	10/03/22	12/22/22	59d	
	1.1.1	☆	Identify human prostate cell line	10/03/22	10/28/22	20d	
	1.1.2	☆	Develop a protocol for cell assays	10/3/22	11/21/22	45d	4
	1.1.2.1	☆	Determine the type of medium and serum required	10/3/22	11/04/22	5d	
	1.1.2.2	☆	Validate optimal conditions for growth	10/3/22	11/21/22	15d	
	1.1.3	☆	Identify methods to quantify expression of gene X	11/22/22	12/22/22	23d	8
	1.1.3.1	☆	Determine whether we can isolate RNA and protein from human prostate cells	11/22/22	12/21/22	22d	
		☆	Test technique used in brain cells for human prostate cells	11/22/22	12/21/22	22d	
		☆	Develop and Validate a new protocol	11/22/22	12/21/22	22d	
	1.1.3.2	☆	Determine whether we can perform quantitative RT-PCR for gene X expression	11/22/22	12/22/22	23d	
		☆	Design primers and positive and negative controls	11/22/22	12/22/22	23d	
	1.1.3.3	☆	Determine whether we can perform a Western blot for gene X expression	11/22/22	12/22/22	23d	
		☆	Test current antibodies used in the brain	11/22/22	12/22/22	23d	
		☆	Identify positive and negative controls for protein quality	11/22/22	12/22/22	23d	
	1.2	★	**Discover/Establish Association of gene X in prostate cancer cells**	**10/03/22**	**12/22/22**	**59d**	
	1.3	★	**Compare results to determine a difference in gene X expression between normal and cancer cells**	**12/22/22**	**01/04/23**	**10d**	
	1.3.1	☆	Determine the difference in RNA expression	12/22/22	01/04/23	10d	
	1.3.2	☆	Determine the difference in protein expression	12/22/22	01/04/23	10d	
	1.3.3	☆	Determine the relationship between RNA and protein	12/22/22	01/04/23	10d	

Milesto...	WBS	Deliver...	Task Name	Actual Start Date	Actual End Date	Duration	Predecess...
	1	★	**Identify the role of gene X in Prostate Cancer**				
	1.1	★	**Discover/Establish Association of gene X in normal prostate cells**	**10/03/22**	**12/22/22**	**59d**	
	1.1.1	☆	Identify human prostate cell line	10/03/22	10/28/22	20d	
	1.1.2	☆	Develop a protocol for cell passage	10/03/22	11/21/22	15d	8
	1.1.2.1	☆	Determine the type of medium and serum required	10/03/22	11/04/22	5d	
	1.1.2.2	☆	Validate optimal conditions for growth	10/31/22	11/21/22	15d	
	1.1.3	☆	Identify methods to quantify expression of gene X	11/22/22	12/22/22	23d	8
	1.1.3.1	☆	Determine whether we can isolate RNA and protein from human prostate cells	11/22/22	12/21/22	22d	
		☆	Test technique used in brain cells for human prostate cells	11/22/22	12/21/22	22d	
		☆	Develop and Validate a new protocol	11/22/22	12/21/22	22d	
	1.1.3.2	☆	Determine whether we can perform quantitative RT-PCR for gene X expression	11/22/22	12/22/22	23d	
		☆	Design primers and positive and negative controls	11/22/22	12/22/22	23d	
	1.1.3.3	☆	Determine whether we can perform a Western blot for gene X expression	11/22/22	12/22/22	23d	
		☆	Test current antibodies used in the brain	11/22/22	12/22/22	23d	
		☆	Identify positive and negative controls for protein quality	11/22/22	12/22/22	23d	
	1.2	★	**Discover/Establish Association of gene X in prostate cancer cells**	**10/03/22**	**12/22/22**	**59d**	
	1.3	★	**Compare results to determine a difference in gene X expression between normal and cancer cells**	**12/22/22**	**01/04/23**	**10d**	
	1.3.1	☆	Determine the difference in RNA expression	12/22/22	01/04/23	10d	
	1.3.2	☆	Determine the difference in protein expression	12/22/22	01/04/23	10d	
	1.3.3	☆	Determine the relationship between RNA and protein	12/22/22	01/04/23	10d	



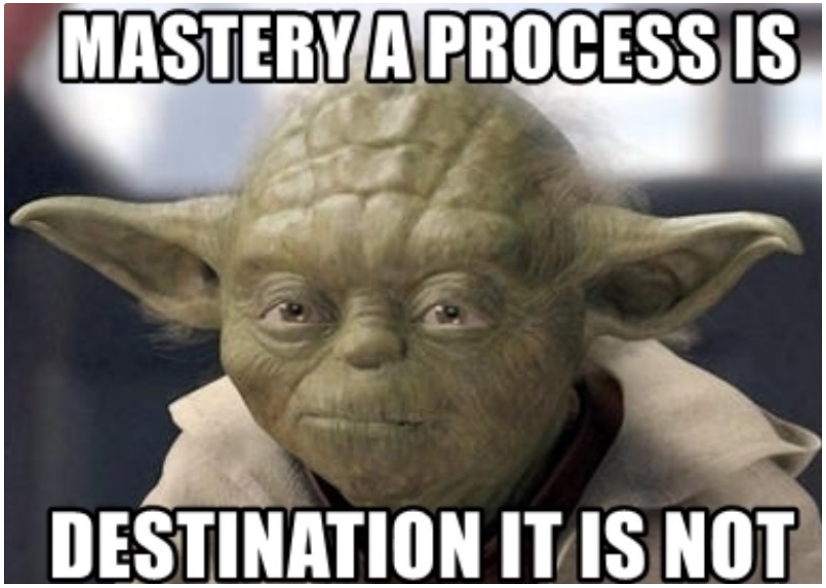
QUIZ TIME

Please respond to the poll requests



Children's Hospital of Philadelphia
RESEARCH INSTITUTE

FINAL QUESTIONS?



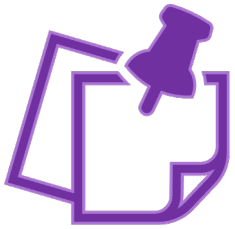
DON'T FORGET TO COMPLETE YOUR SURVEY

Reference #

WHO YOU GONNA CALL?

- Research Project Management Office (Research Admin)
  - Program and Project Management
  - Process Improvements, RFPs, System Implementations
  - Audit and Governance
  - DL email: DL-ResearchPMO@chop.edu
- Strategy Integration (Enterprise)
  - Business Process Improvement
  - Business Consulting
  - Program and Project Management
  - https://at.chop.edu/sites/administration/strategy
    - Submit an intake for review
- Center for Healthcare Quality & Analytics (CHQA)
  - Clinical Process Improvement
  - Data & Analytics
  - https://at.chop.edu/chqa

ADDITIONAL RESOURCES

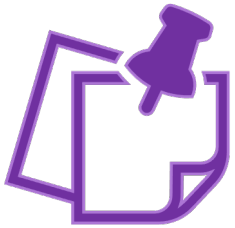


Children's Hospital of Philadelphia®
RESEARCH INSTITUTE

ADDITIONAL RESOURCES

- Take a class at CHOP:
  - Project Management
  - Applying Improvement Methods (AIM)
  - Leading Improvement Course (LIC)
  - MS Office
  - DISC I & II with your team
  - CLI: Presenting with Impact: Presentations Skills Workshop
  - Virtual Meeting Technology Coaching Session
- Strategy Integration
  - https://at.chop.edu/sites/administration/strategy
  - Business Process Improvement
- Continuous Improvement Class (recommendation from PMO) – CHQA Team
  - https://at.chop.edu/chqa/Pages/Home.aspx
  - Clinical Process Improvement

ADDITIONAL TOOLS



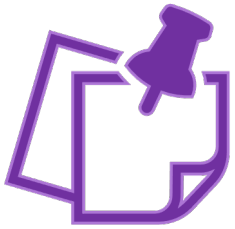
Children's Hospital of Philadelphia
RESEARCH INSTITUTE

ADDITIONAL TOOLS

- Collaboration Tools:
  - Microsoft Teams
  - Spreadsheets
  - Slides
  - Video Conferences
  - 1:1 chats Emails
  - Visio
  - Microsoft PowerPoint

- Cloud-based Tools:
  - ServiceNow
  - Smartsheet*

KEY TERMS & DEFINITIONS



Children's Hospital of Philadelphia®
RESEARCH INSTITUTE

KEY TERMINOLOGY

- Work Breakdown Structure (WBS): A hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables
- Deliverables: The elements of the scope the project will deliver, once all deliverables are met, the scope has been met.
- Milestones: Scheduled based accomplishment, usually acts as a dependence for other milestones, deliverables, or tasks.
- Tasks/Activities: Actions needed to be taken to complete deliverables or milestones.
- Project: A temporary endeavor with a definitive beginning and end.
- Project Scope: The work performed to deliver a product, service, or result with the specified features and functions. The term "project scope" is sometimes viewed as including the product scope.
- Product backlog: A prioritized features list containing a short description of all functionality desired in end product or deliverables
- Agile: The Agile methodology is primarily used for software development projects and is an approach whereby requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customer/end user
- Kanban board: "Kanban" is the Japanese word for "visual signal." A Kanban board helps make your work visible so you can easily monitor and keep everyone on the same page. Kanban boards use cards and columns to help technology and service teams commit to the right amount of work.
- Epics: High level business requirements. In agile, an epic is a large body of work than can be broken down into specific tasks (user stories) based on needs of the customer or end-user.
- User story: The smallest unit of work or smallest aspect of a feature in an agile framework.

Waterfall

Is a sequential, linear eight-stage process. Once a stage is complete, the development team moves on t the next step and can't go backward without starting the process from the beginning.

Advantages

- Easy to manage
- Enforced discipline
- Well documented

Disadvantages

- Changes can be expensive
- Not easily scalable
- Early requirements gathering

Agile

Is an incremental, iterative approach. Constant end user feedback facilitates adaptability. Teams work on iterations over a period of time, and work is prioritized based on value.

Advantages

- Embraced change
- Faster delivery
- Continuous improvement

Disadvantages

- Variable planning
- Imminent commitment
- Volatile deliverables

Hybrid

Breaks projects into manageable components by discipline or functionality. The waterfall method is used to map out paths while development and release follows the agile project method for quality products in less time

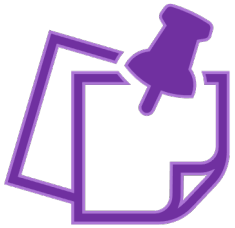
Advantages

- Best with large projects
- Efficient execution
- Supports strategic goals

Disadvantages

- Not best for small projects
- Skewed metrics
- High skill level required

REFERENCES



Children's Hospital of Philadelphia®
RESEARCH INSTITUTE

REFERENCE LIST

1. Image sourced from: https://www.forbes.com/advisor/business/what-is-work-breakdown-structure/
2. Brotherton, S. A., Fried, R. T., & Norman, E. S. (2008). Applying the work breakdown structure to the project management lifecycle. Paper presented at PMI Global Congress 2008—North America, Denver, CO. Newtown Square, PA: Project Management Institute, from https://www.pmi.org/learning/library/applying-work-breakdown-structure-project-lifecycle-6979
3. Norman, E. S. (2007). Developing and elaborating effective work breakdown structures. Paper presented at PMI® Global Congress 2007—North America, Atlanta, GA. Newtown Square, PA: Project Management Institute, from https://www.pmi.org/learning/library/developing-elaborating-work-breakdown-structures-7241
4. Berg, C. & Colenso, K. (2000). Work breakdown structure practice standard project—WBS vs. activities. *PM Network, 14*(4), 69–71, from https://www.pmi.org/learning/library/work-breakdown-structure-practice-standard-4591
5. Sutherland, J. J. (2022, June 21). *Product backlog item (PBI)*. Scrum Inc. Retrieved September 15, 2022, from https://www.scruminc.com/product-backlog-item-pbi/
6. Velazquez, E. (F. (2022, February 2). *Managing software project SCOPE: WBS vs. product backlog*. Agile Cheetah. Retrieved September 15, 2022, from https://agilecheetah.com/managing-software-project-scope-wbs-vs-product-backlog/
7. What is product backlog in scrum? who responsible for it? (n.d.). Retrieved September 15, 2022, from https://www.visual-paradigm.com/scrum/what-is-product-backlog-in-scrum/

REFERENCE LIST CONTINUED

8. Image sourced from: https://biorender.com/
9. Image sourced from: https://www.northstargroupllc.com/blog/project-management-establishing-a-work-breakdown-structure-part-2/
10. Guberman, Jean, et al. *Making the Right Moves: A practical guide to scientific management for Postdocs and New Faculty.* Second edition. Chevy Chase, Maryland: Howard Hughes Medical Institute and Research Triangle Park, North Carolina: Burroughs Welcome Fund, 2006. http://www.hhmi.org/labmanagament.
11. The Ohio State University: Center for clinical and translational science. “Project Management for Research: The tools you need to make your research project a success.” https://ccts.osu.edu/content/project-management-research
12. Portny, Stanley E. “Project Management Toolkit for Scientists.” Wiley. 2019. https://www.wiley.com/learn/professionalscience/pdf/pm-toolkit.pdf
13. Case Western Reserve University: School of Science, Clinical and Translational Science Collaborative. “Project Management: Guides to the Basics.” https://case.edu/medicine/ctsc/clinical-study-resources/project-management-guides-basics
14. Swiatek, Peter R, et al. *Surgery and Research: A practical approach to managing the research process.* Plast Reconstr Surg. 2016. 137(1):361-366. PMID: 26710037.
15. The Interventional Studies in Aging Center (ISAC) at the Institute for Aging Research (IFAR). "A Clinical Trials Toolkit.” https://ifar-connect.hsl.harvard.edu/isac_book/project-management.html
16. Skill Path. Project Management One-Day Workshop, Participant Workbook. https://skillpath.com/


Thank You!