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Visualization of Programming Activities and Deliverables for Multiple Clinical Studies

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ABSTRACT

Managing programming activities is very challenging, especially when multiple studies are involved with competing deliverables for each study. As a project programming lead, to ensure that all programming deliverables are on track with high quality and an optimized resource usage is critical. Therefore, an efficient planning and monitoring is key to a successful programming management.

This paper presents one comprehensive visualization of the programming activities and deliverables for multiple studies, including key deliverable timelines and major study information for tracking progresses in real-time. The graph is generated using SAS® Graph Template Language (GTL), which enable to create your own custom graphs or to modify graphs created by SAS® analytical procedures. The example presented in this paper illustrates how assignments and deliverables from multiple studies can be dynamically visualized and managed in a powerful manner.

KEYWORDS

Graph Template Language (GTL), Visualization, Programming Activities and Deliverables, Multiple Clinical Studies, Bubble Plot, Real-Time, Planning and Monitoring

INTRODUCTION

When multiple studies or deliverables are involved in one or more projects, planning and monitoring for programming support can be challenging due to prioritization, timing, resource usage, and expected quality. Therefore, efficient planning and monitoring is key to meeting stakeholder expectations for successful programming management.

This paper presents one approach to visualize programming activities by utilizing a bubble plot, which allows users to track, manage, and visualize progress in real-time of programming deliverables for multiple studies. It can consist of various information relevant to programming activities and deliverables, which can help to successfully optimize programming resource usage and be on track for high quality deliverables.

BUBBLE PLOT

Figure 1 displayed below is a bubble plot created using SAS® Graph Template Language. The following information is reflected in the graph:

- project/study
- study phase
- milestones of key events
- numbers of countries, study centers, and subjects
- real-time progress tracking against key events

The five key components mentioned above will be discussed below in detail.

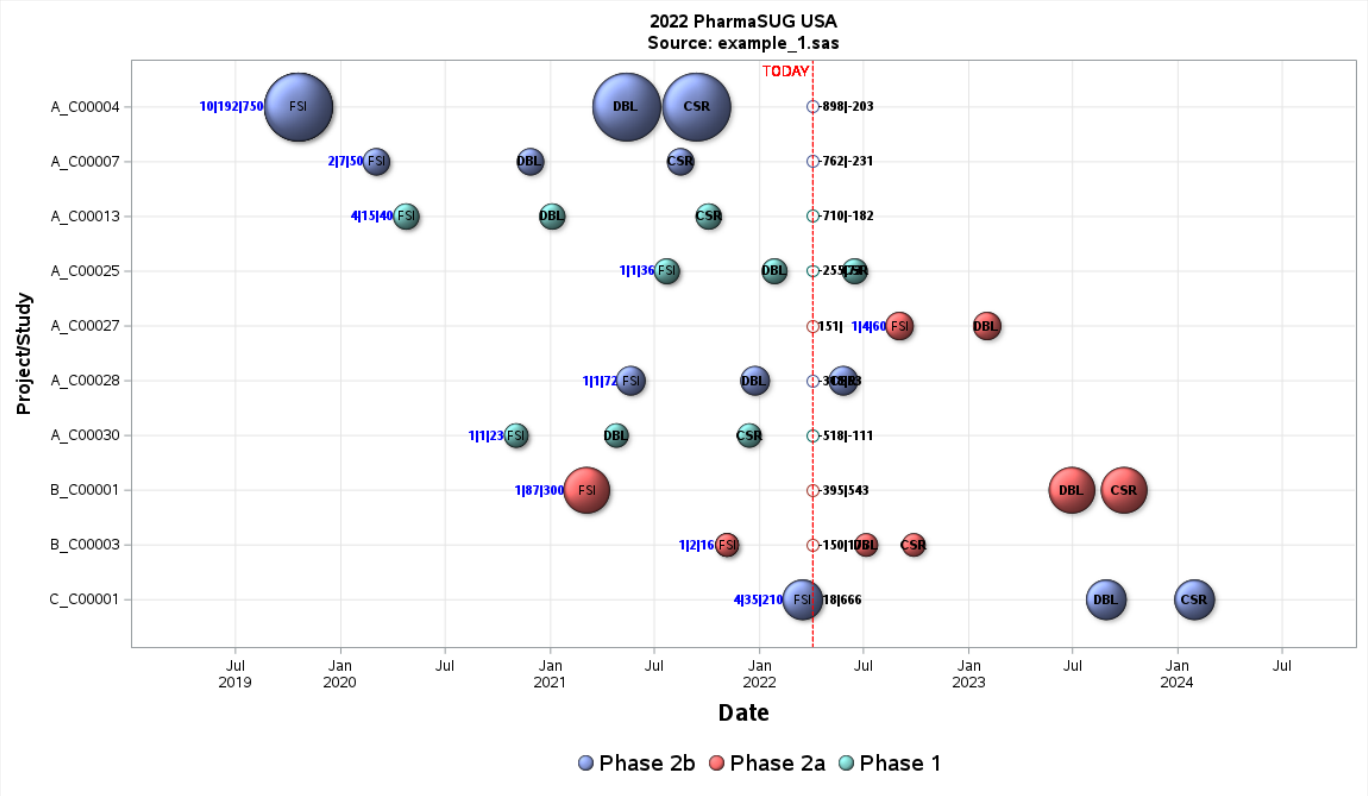

Figure 1. An Example of Bubble Plot for Visualization of Programming Activities and Deliverables for Multiple Clinical Studies

PROJECT/STUDY

The vertical axis labels the projects and studies within each project with a hierarchical naming convention. A total of three projects (e.g., A_, B_, C_) and ten studies within these projects (e.g., A_C00004) are included in this example. Based on user needs, each project can consist of a different number of studies, and one project can be displayed with multiple studies consolidated. This functionality gives users the flexibility in how they label and categorize projects and studies.

STUDY PHASE

Different phases of a study are captured in different colored bubbles in the graph's legend. As the example in Figure 1 illustrates, there are three different phases included across the ten example studies, but additional phases can be added as relevant.

MILESTONE OF KEY EVENTS

In Figure 1, three key milestones are illustrated for each study, which are first subject in (FSI), CSR database lock (DBL), and CSR package deliverable (CSR). Based on the user needs, the types of milestones (i.e. Interim Analysis(IA), Last Subject Last Visit(LSLV)) can be added. Therefore, the number of milestones can differ from a study to another(i.e. study A_C00027 has no milestone of CSR).

NUMBERS OF COUNTRIES/STUDY CENTERS/SUBJECTS

In front of the first milestone symbol for each study, there are three numbers concatenated in the format of xxx1|xxx2|xxx3 (i.e.,10|192|750 for first study of A_C00004). These numbers respectively represent the number of countries, number of study centers, and number of subjects in a study. Additionally, the total number of subjects per study is proportionally reflected on the size of the bubble, which may help to inform programming support and resourcing decisions.

REAL-TIME PROGRESS TRACKING AGAINST KEY EVENTS

In Figure 1, there are two numbers concatenated along a red vertical line labeled 'Today' in the format of xxx1|xxx2 for each study (i.e., -989|-203 for first study of A_C00004). These numbers represent the number of days relative to 'Today' (i.e., the graph's auto-generated current date), to the selected milestones for the real-time presentation. In the example illustrated in Figure 1, the FSI and CSR milestones have been selected. A negative number of days indicates milestones that have already passed, and a positive number of days tracks how many days remain before the milestone will occur.

CONCLUSION

To overcome the challenges of managing programming activities and deliverables for multiple clinical studies, a bubble plot can be a powerful tool in visualizing milestone status in real-time. A project programming lead can use this tool to have a clearer visualization of deliverable prioritization across various studies. In general, a bubble plot in combination with other types of graphs can be used to envisage resourcing alignment, task assignment, delivery tracking between planed and actual, and project status in detail. With efficient planning and monitoring, programming management can successfully optimize resource usage and be on track for high quality deliverables.

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RECOMMENDED READING

- *Base SAS® Procedures Guide*
- SAS® 9.4 *Graph Template Language*: User's Guide, Fifth Edition

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