

**SKILLS FRAMEWORK FOR BIOPHARMACEUTICALS MANUFACTURING
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT**

TSC Category	Process Development/Manufacturing Science and Technology					
TSC	Big Data Analysis					
TSC Description	Apply data analytics techniques and tools to analyse significant volumes of data and draw patterns and trends for investigating business problems					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			BPM-PST-3001-1.1	BPM-PST-4001-1.1	BPM-PST-5001-1.1	
			Conduct predictive modelling, regression analysis, scenario modelling and other types of data analysis with large datasets	Align requirements of statistical models to business needs and publish analytics models to a production environment for operational use	Facilitate the identification and investigation of business problems and select data analytics technologies and tools to be implemented	
Knowledge			<ul style="list-style-type: none"> Types of data and data sources Types of tools and programming languages for analysing big datasets Data collection processes Concepts of data quality Methods of working with large datasets and filtering noise data Types of statistical data modelling techniques Methods of creating reports of findings from analytical work 	<ul style="list-style-type: none"> Applications of advanced analytical methods in a biopharmaceuticals manufacturing context Principles of analytics architecture Methods of reviewing statistical models Existing analytical tools or data warehouses in the organisation Types of different data analytics technologies and tools Methods of preparing statistical models for operational use Types of data presentation techniques 	<ul style="list-style-type: none"> Organisation's vision and strategies Types of business problems that can be investigated using advanced analytics Components of different data analytics technologies and tools Sources of big data Types of big data frameworks Methods of forming data analytics plans 	
Abilities			<ul style="list-style-type: none"> Review data requirements for the analytics projects Load data into the analytics platforms Cleanse and transform the data according to the data requirements Resolve and follow up with any issues arising during the data preparation 	<ul style="list-style-type: none"> Select the runtime environments for the statistical models to be deployed Define user requirements with the relevant stakeholders Define the analytics architecture requirements with the Information Technology (IT) department 	<ul style="list-style-type: none"> Define the business problems to be investigated using advanced analytics with key business stakeholders Evaluate and select appropriate advanced analytics technologies and tools Conceptualise new data models and evaluate 	

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			<ul style="list-style-type: none"> Contribute to creating technical and business reports with the analytical findings 	<ul style="list-style-type: none"> Publish the statistical models to production Develop the processes to support the operations of the models with relevant stakeholders Monitor and fine-tune the deployed models to ensure delivery of the expected outcomes Implement analytical and visualisation techniques to present large quantities of data Evaluate results to extract commercial impacts that may affect business objectives Communicate results, using textual, numeric, graphical and other visualisation methods appropriate to the target audience 	<p>existing models for suitability</p> <ul style="list-style-type: none"> Define new areas of focus that can be analysed using advanced methods Provide leadership and expert guidance for analysing both internal and external data 	
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