Software as a Service (SaaS)

# RISK-BASED VALIDATION WITH TIME-SAVING TEMPLATES



David Nettleton and Janet Gough

# Software as a Service (SaaS)

## RISK-BASED VALIDATION WITH TIME-SAVING TEMPLATES

To order the book, please visit: go.pda.org/SAAS

David Nettleton and Janet Gough

#### 10 9 8 7 6 5 4 3 2

## ISBN: 978-1-942911-49-4 Copyright © 2020 by David Nettleton and Janet Gough. All rights reserved.

All rights reserved. This book is protected by copyright. No part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the publisher. Printed in the United States of America.

Where a product trademark, registration mark, or other protected mark is made in the text, ownership of the mark remains with the lawful owner of the mark. No claim, intentional or otherwise, is made by reference to any such marks in the book.

At the time of printing, all web site links referenced functioned, however PDA and DHI cannot guarantee the accuracy of the information or that the listed web sites will not move or delete information.

While every effort has been made by the publishers, editor, and authors to ensure the accuracy of the information contained in this book, this organization accepts no responsibility for errors or omissions. The views expressed in this book are those of the editor and authors and may not represent those of either Davis Healthcare International or the PDA, its officers, or directors.



Connecting People, Science and Regulation®



This book is printed on sustainable resource paper approved by the Forest Stewardship Council. The printer, Gasch Printing, is a member of the Green Press Initiative and all paper used is from SFI (Sustainable Forest Initiative) certified mills.

#### PDA

Davis Healthcare International Publishing, LLC

4350 East West Highway Suite 200 Bethesda, MD 20814 United States www.pda.org/bookstore 001-301-986-0293 2636 West Street River Grove IL 60171 United States www.DHIBooks.com

## CONTENTS

Preface	xi
About the Authors	
Introduction	xvi
1. Understanding the Process	1
Determining System Risk and Priority	3
Systematic Computer System Validation	4
System as Well as Software	5
Spreadsheet Applications in Regulated	8
Environments	
What Inspectors and Auditors Look for	10
Electronic Signatures	11
Upper Management's Role	12
The Validation Team	13
Capturing the History to Date	14
Determining the Scope	15
Who	15
What	16
When	17
Where	17
Why	17
The Ten-Step Process	18
Step One – User Requirements	19
Step Two – Project Plan	19
Step Three – Installation Protocol	19
Step Four – Installation Report	20
Step Five – Functional Specifications	20
Step Six – Hazard Analysis	20

	Step Seven – User Testing Protocol	20
	Step Eight – User Testing Report	21
	Step Nine – System Release Report	21
	Step Ten – Validation Completion Report	21
	Setting a Workable Timeframe	22
	Making Validation a Standard Part of Business Operations	24
2.	The Groundwork	27
	Implementing COTS Software	28
	Software Developers as Vendors	28
	Purchasing COTS Software	29
	Qualifying the Vendor	31
	Contractual Agreements	32
	Affirm a Vendor's Compliance Letter	33
	Assessing the Validation Needs	34
	Establishing the Validation Team	35
	Starting the Validation Packet	37
	Identifying Related Documents	39
	General Procedures	39
	Assessing Existing Documents	42
	System-Specific Procedures	43
	Other Documents	44
	Delegating the Document Development Process	45
	Formatting the Validation Documents	45
	User Requirements	46
	Writing the User Requirements Report	47
	Purpose	48
	Justification	48
	Intended Users	48
	Process Overview	48
	References	49

v

	Operating Environment	49
	Software Platform	49
	Sizing	49
	Interfaces	50
	Functional Requirements	50
	Securing Approval Signatures	51
3.	The Plan and Installation	52
	The Plan	52
	Writing the Plan	53
	Purpose	54
	Validation Guidance	54
	Validation Deliverables	54
	History	56
	Resources	56
	Project Team	56
	Validation Training	56
	Project Scheduling	57
	Project Budget	57
	Securing Approval of the Plan	57
	The Software Police	58
	The Installation	59
	Writing the Installation Protocol	61
	Purpose	62
	Impact Analysis	62
	Installation Liaison	62
	Information Technology Representative(s)	62
	Installers	63
	Hardware Components	63
	Environmental Conditions	63
	Software Components	63
	Design Overview	64

vi

Васкир	64
Installation Instructions	64
Testing	65
Testers	65
Media And Materials	66
Securing Approval of the Installation Protocol	66
Installation and Testing	66
Writing the Installation Report	66
Purpose	68
Installation Deviations	68
Environmental Conditions	68
Installation Results	69
Securing Approval of the Installation Report	69
The System Event Log	69
Monitoring Associated Documents and Correspondence	70
4. Functional Specifications and Hazard Analysis	71
Functional Specifications	71
Writing the Functional Specifications	73
Purpose	74
System Overview	75
Functional Specifications	75
Existing Related Documents	75
Traceability Matrix	75
Securing Approval of the Functional Specifications	76
Developer's Validation is Different from User Validation	76
Hazard Analysis	79
Writing the Hazard Analysis Report	81
Purpose	0.
	82
Hazard Analysis	•••

Securing Approval of the Hazard Analysis	85
Progress Check	85
5. Training, User Testing, and System Release	87
Assessing the System Standard Operating Procedures and Instructions	87
Training	88
The Need for Training	90
21 CFR Part 211—Current Good Manufacturing Practice for Finished Pharmaceuticals	90
Subpart B—Organization and Personnel	90
§ 211.25 Personnel Qualifications	
§ 211.34 Consultants	91
21 CFR Part 606—Current Good Manufacturing Practice for Blood and Blood Components	91
Subpart B—Organization and Personnel §606.20 Personnel	91
21 CFR Part 820—Quality System Regulations	92
Subpart B—Quality System Requirements § 820.20 Management Responsibility	92
§ 820.25 Personnel	92
Subpart G—Production and Process Controls	93
§ 820.70 Production And Process Controls	
ICH Q7A Good Manufacturing Practice Guide for Active Pharmaceutical Ingredients	93
3 Personnel	93
3.1 Personnel Qualifications	93
Writing the User Testing Protocol	95
Purpose	96
Testers	96
Testing Approaches	96
Test Environment	96
Error Reporting Plan	96
Test Cases	97
Test Results Documentation	98

viii

Preparing the Test Forms	98
Securing Approval of User Testing Protocol	100
Conducting Testing	100
Testing Review	102
Writing the User Testing Report	102
Purpose	103
Testing Dates	104
Configuration Tested	104
Test Case Execution	104
Error Reporting Log	104
Test Case Review	104
Testing Conclusion	104
Securing Approval of the User Testing Report	105
Finalizing the Last Outstanding Documents	105
System Release	105
Writing the System Release Report	106
Purpose	107
Schedule	107
Completed Documents	107
Release Instructions	107
User Training	108
Production Change Control	108
Production Review	108
Conclusion	109
Securing Approval of the System Release Repor	t 109
Troubleshooting	109
Assessing the System and Remaining Vigilant	: 111
Writing the Validation Completion Report	113
Purpose	114
Release Date	114
Production Review Results	114

	Project Documentation Storage	114
	Conclusion	115
	Securing Approval Signatures	115
	Completing the Validation Packet	115
	Electronic Signature Notification	116
	Remaining Vigilant	116
	Revising Documents in Place	118
	Revalidating the System	118
	Forming a Computer System Validation Committee (P11c)	120
	Keeping Abreast of Industry Standards	121
	Looking Toward the Future	122
7.	Writing Guidelines	123
	Know Your Audience	124
	Be Clear and Concise	125
	Avoid Ambiguity	127
	Use the Passive Voice Selectively	128
	Strive for Consistency	130
	Tables	130
	Hazard Analysis	130
	Use the Appropriate Tense for the Message	131
	Past Tense	131
	Present Tense	132
	Imperative Voice	132
	The Future Tense	132
	Writing Procedures	133
	1. Use the Present Tense	133
	2. Use the Correct Voice	133
	3. Limit the Number of Actions in a Step	134
	4. Avoid the Conditional	134
	5. Be Consistent	135

6. Put Information Down in the Right Sequence	135
7. Be Precise	135
8. Be Consistent from Document to Document	135
9. Don't Make Up Words	136
10. Don't Mention People by Name	136
Select Punctuation Marks	136
The Comma	136
Set Off Long Introductory Elements with Commas	137
Use a Serial Comma in a List – or Not	137
Colons	137
Semi-Colons	138
Periods and Parentheses	138
Periods and Bullets	139
The Bottom Line	139
References	141
Index	147

mach	
Get the Templates!	154

## PREFACE

This book expands upon *Risk-Based Software Validation: Ten Easy Steps* and offers a systematic, step-by-step approach for validating configurable off-the-shelf (COTS) computer software that generates data or controls information about products and processes subject to binding regulations. It is for any application hosting: Software as a Service (Saas) or in-house/on-site. Following the steps it delineates will take you from the determination to validate to the assessment of the validation outcome without time-consuming effort. The purchase of this book also gives you access to templates the authors have used as training tools for more than 1000 companies and components of over 300 validation projects. You will get from start to "go live" in the most efficient way.

### About the Book

This book expands upon Risk-Based Software Validation: Ten Easy Steps and offers a systematic, step-by-step approach for validating Commercial off-the-Shelf (COTS) computer software that generates data or controls information about products and processes subject to binding regulations. It is for any application hosting: Software as a Service (Saas) or in-house/on-site. Following the steps it delineates will take you from the determination to validate to the assessment of the validation outcome without time-consuming effort.

Here are answers to such questions as:

- Why do we need to validate software if vendors have already done so?
- What needs computer system validation?
- What is application hosting?
- What are typical data centers?
- What is Software as a Service (SaaS)?
- What is cloud hosting?
- Does hosting affect validation?

And much more relevant detail is also included to assist you establish a compliant, timely and successful program. An additional benefit of this text is the purchase of this book also gives you access to templates the authors have used as training tools for more than 1000 companies and components of over 300 validation projects. You will get from start to "go live" in the most efficient way.

### About the Authors



David Nettleton is an industry leader, author, and teacher for 21 CFR Part 11, Annex 11, HIPAA, EU General Date Protection Regulation (GDPR), software validation, and computer system validation. He is involved with the development, purchase, installation, operation, and maintenance of computerized systems used in FDA-compliant applications. He has completed more than 300 mission-critical laboratory, clinical, and manufacturing software implementation projects.

### Janet Gough

Janet Gough trains staff in medical and technical writing within the regulated environment. She helps prepare documentation and assists companies in designing and implementing document management systems for compliance with 21 CFR Part 11 and the predicate rules. She has taught English in university graduate and undergraduate programs and served as a director of technical communications for a biotechnical company. She has written over 35 journal articles and authored and co-authored 15 industry books.



Printed in the United States of America

