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Topic 27 Overview of Domain Engineering	<ul> <li>The objective is         <ul> <li>to make you feel at ease with the very many stages and steps of domain development, and the very many parts of resulting</li> </ul> </li> </ul>		
• The <b>prerequisite</b> for following this (part of the) lecture is that you are ready now to embark on the long journey of getting to understand the first of the three core phases of software	<ul><li>documents.</li><li>The <b>treatment</b> is informal and systematic.</li></ul>		
development.			
<ul> <li>The aims are</li> <li>★ to present a capsule view of stages and steps of domain</li> </ul>			
<ul> <li>* to present a capsule view of stages and steps of domain engineering, and</li> <li>* to present a capsule view of the documents that result from domain engineering.</li> </ul>			
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As has been argued before:			
<ul> <li>As has been argued before.</li> <li>★ Before we can design the software, we must understand its</li> </ul>	Characterisation 8.139 By a <i>domain model</i> we understand the meaning of a domain description.		
<ul><li>requirements.</li><li>* And before we can develop requirements, we must understand the application domain.</li></ul>	Characterisation 8.140 By a <i>domain description</i> we mean a document (or a set of documents) which describes what the domain is, its entities, functions, events and behaviours.		
• In earlier lectures we reviewed domain engineering.	Characterisation 8.141 By a <i>domain theory</i> we mean a set of theorems that are claimed to hold of the domain model.		
<ul> <li>Now we give a more systematic and comprehensive treatment.</li> <li>We shall emphasize principles, techniques and tools of domain engineering.</li> </ul>	<b>Characterisation 8.142</b> By <i>domain engineering</i> we mean the processes overviewed in this chapter and otherwise detailed in this part.		
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<ul> <li>An Analogy:</li> <li>* Just as physicists have researched and developed models of Mother Nature for at least 500 years.</li> </ul>	<ul> <li>To research and develop domain theories is a new activity.</li> <li>But many present software engineering processes already touch upon domain engineering.</li> </ul>		
<ul> <li>★ and just as classical engineers have designed artifacts based on the theories of the natural sciences,</li> <li>★ so we shall advocate research into and the development of</li> </ul>	• In these lectures we bring domain engineering <i>more out into the open</i> , thus simplifying many past concerns of software engineering,		
theories of the man-made domains in which human activities,	<ul><li>especially those of requirements engineering.</li><li>That is, we strongly think that many previously — by other</li></ul>		
rather than nature, play the major role. ★ Then we can develop software more believably.	authors — advocated issues of requirements engineering become far easier to handle (or they outright "disappear") once we have done our domain engineering job!		
	• So we claim, at least!		
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Overview of Lecture	Domain Stakeholders and Their Perspectives		
• Proper domain engineering, i.e., the proper development of a domain model, proceeds in stages:	Characterisation 8.143 By a <i>domain stakeholder</i> we shall understand		
<ul> <li>★ identification of domain stakeholders</li> <li>★ domain acquisition</li> </ul>	• a person, or a group of persons, united somehow in their common interest in, or dependency on the domain; or		
<ul> <li>★ domain acquisition</li> <li>★ domain analysis and concept formation</li> <li>★ domain modelling</li> </ul>	<ul> <li>an institution, an enterprise or a group of such, (again) characterised (and, again, loosely) by their common interest in or</li> </ul>		
. coman moderning	dependency on the domain		
$\star$ domain validation and verification			
<ul><li>★ domain validation and verification</li><li>★ domain theory formation</li></ul>			

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Characterisation 8.144 By a domain stakeholder perspective we understand	Domain Acquisition and Validation /
• the, or an, understanding of the domain shared by	Characterisation $8.145$ By domain acquisition we understand
• the specifically identified stakeholder group —	• the gathering, from domain stakeholders, from literature and from
• a view that may differ from one stakeholder group to another	our observations, of • knowledge about the domain.
stakeholder group of the same domain	
•	<ul> <li>This knowledge includes</li> <li>phenomenological <i>entities</i>, <i>functions</i>, <i>events</i> and <i>behaviours</i>,</li> </ul>
	<ul><li>with this "gathering" being manifested in terms of rough</li></ul>
<b>Domain Stakeholders</b> Without clearly identifying and liaising with all relevant domain stakeholders one cannot hope to construct a	statements (i.e., fragments of sketches)
believable domain model.	· · ·
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$Characterisation \ 8.146 \ {\rm By} \ domain \ validation \ {\rm we \ understand}$	Domain Analysis and Concept Formation
$\bullet$ the assurance, with stakeholders, notably clients, that	Characterisation 8.147 By domain analysis we understand
$\bullet$ the domain descriptions produced as a result of	• a study of domain acquisition (rough) statements,
• domain acquisition, domain analysis, concept formation and	<ul><li>with the aim of discovering inconsistencies, conflicts and</li></ul>
domain modelling (the latter including the description)	incompletenesses within,
$\bullet$ is commensurate with how the stakeholders view the domain	• as well as with the aim of forming concepts from,
•	$\bullet$ these domain acquisition statements
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Characterisation 8.148 By domain concept formation we understand	Domain Facets
• the abstraction of domain phenomena, as hinted at by domain	Characterisation 8.149 By a <i>domain facet</i> we understand
acquisition (rough) statements,	• one amongst a finite set of generic ways
• into concepts	• of analysing a domain, that is,
· •	• a view of the domain
	• such that the different facets cover conceptually different views,
	• and such that these views together cover the domain
	· •
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We list the main categories of domain facets:	Domain Model $\equiv$ Model of Domain Facets So by a domain model we
business procedure facets	mean a set of one or more commensurate models of domain facets —
intrinsic facets	these may possibly be rewritten (and reformalised) into one
support technology facets	consolidated model.
management and organisation facets	
<ul> <li>management and organisation facets</li> <li>rules and regulations facets</li> </ul>	
• script facets	
human behaviour	
+ 66-655 222, Eur + 66 483 824 🖉 Dim Bjann, Falley II, 06 300 Mate, Denzak Evalut, Billiona, da, A Japanghall au, Anthépine Ja, 185, swalina da, A /	de 1633 201, Far. + 6 483 201 © Dan Rjano. Finding 11, DS-286 Adri, Danask Evado, Algoredgestian, dandhjener bio UB, wao instatu Al "de

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Auxiliary Stages of Domain Development		they "adorn" the major stages of	- /
• The auxiliary stages of development include the following:	domain facet modelling:		
* domain (knowledge) analysis and concept formation	* then we must analyse what has been acquired, and form		
	concepts from what has been analysed; * then we can describe it: (a) roughly, (b) terminologise it, (c)		
		narrate and (d) possibly formalise the facet. Stages (a–d) form	
★ domain (knowledge) valuation ★ domain theory formation.	<ul> <li>In between these latter descriptive activities, we</li> <li>* verify properties of the domain model,</li> </ul>		
* domain theory formation.			
	* verify properties of the domain model, * validate the domain facet description (i.e., the model), and		
	* possibly we build up element	nts of a theory of the domain.	
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9.1 A Prview of Things to Come     Initial Advances Making Table 2006, 00:19       homes (ds)veli1/26d8/26d8     April 5, 2006, 00:19       Page 782, Topic: 27, Foil: 19     Riskal Porsson Falls, Dir Stall Fall and the Standard Riskal Porsson Fall	Contents of a Domain Model Document w/db/voll/3ptiv/db-3ptiv-dom-toc April 5, 2006, 09:19	Pager 783, Topic: 27, Foil: 20 Richard Pearson Plade, Dir-2006 KgcLingley, Denmark	Ħ
The Domain Model Document	Contents of a Don	nain Model Document	_/
A Preview of Things to Come	A Generic Domain Documentation Contents Listing		
• The aim of domain engineering is to create informative, descriptive and analytic	A Generic Domain Documentatio	in contents Listing	
documents about and constituting the domain model.	1. Information	(h) Implicit/Derivative Goals	
• Therefore it is important to always keep in mind what a possible contents listing	(a) Name, Place and Date	(i) Synopsis	
could be of such a complete set of documents.	(b) Partners	(j) Standards Compliance	
• We shall therefore outline, in "capsule" form, what a possible, and, to us,	(c) Current Situation	(k) Contracts	
desirable <i>table of contents</i> structure could be of such a set of domain documents.	(d) Needs and Ideas	(I) The Teams	
	(e) Concepts and Facilities	i. Management	
<ul> <li>The aim of these next lectures is, therefore, to present the principles, techniques and tools for creating, i.e., developing, such sets of domain documents.</li> </ul>	(f) Scope and Span	ii. Developers	
and tools for creating, no., developing, outer one of domain documento.	(g) Assumptions and	iii. Client Staff	
	Dependencies	iv. Consultants	
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2. Descriptions (e) Facets:	3. Analyses	i. Stakeholder	
(a) Stakeholders i. Intrinsics	(a) Domain Analysis and	Walk-Throughs	<u> </u>
(b) The Acquisition Process ii. Support Technologies	Concept Formation	ii. Resolutions	
i. Studies iii. Management and	i. Inconsistencies	(c) Domain Verification	
ii. Interviews Organisation	ii. Conflicts	i. Model Checkings	
iii. Questionnaires iv. Rules and Regulations	iii. Incompletenesses	ii. Theorems and Proofs	
iv. Indexed Description Units v. Scripts	iv. Resolutions	iii. Test Cases and Tests	
(c) Terminology vi. Human Behaviour	(b) Domain Validation	(d) (Towards a) Domain Theory	/
(d) Business Processes (f) Consolidated Description			
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Further Structure of Next Lectures			
• We start with a brief analysis of the stakeholder concept.			
• To know how to properly acquire domain knowledge we believe that it is			
important to know what the end result of domain engineering should be.			
$\star$ We therefore detail two core aspects of a domain model:			
♦ the attributes of the phenomena and concepts modelled,			
♦ and the facets of domain phenomena and concepts.			
• Thus we present principles and techniques for those aspects of domain models.			
• And we do so before we treat principles and techniques for domain acquisition.			
• Then we cover domain analysis and concept formation — on which the domain we dela build			
models build.			
<ul> <li>Once domain models are believed ready, they can be validated, and stages and steps of domain modelling work can be verified — often during domain</li> </ul>			
modelling.			
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