DOWNLOAD PDF ROUND-TRIP DESIGN: A CASE STUDY

Chapter 1 : CiteSeerX â€” A Case Study Using the Round-Trip Strategy for State-Based Class Testing

The case study research design is also useful for testing whether scientific theories and models actually work in the real world. You may come out with a great computer model for describing how the ecosystem of a rock pool works but it is only by trying it out on a real life pool that you can see if it is a realistic simulation.

Saul McLeod , published Case studies are in-depth investigations of a single person, group, event or community. Typically, data are gathered from a variety of sources and by using several different methods e. The research may also continue for an extended period of time, so processes and developments can be studied as they happen. The case study research method originated in clinical medicine the case history, i. The case study is not itself a research method, but researchers select methods of data collection and analysis that will generate material suitable for case studies. Most of this information is likely to be qualitative i. The data collected can be analyzed using different theories e. All the approaches mentioned here use preconceived categories in the analysis and they are ideographic in their approach, i. Case studies are widely used in psychology and amongst the best known were the ones carried out by Sigmund Freud. He conducted very detailed investigations into the private lives of his patients in an attempt to both understand and help them overcome their illnesses. Even today case histories are one of the main methods of investigation in abnormal psychology and psychiatry. For students of these disciplines they can give a vivid insight into what those who suffer from mental illness often have to endure. Case studies are often conducted in clinical medicine and involve collecting and reporting descriptive information about a particular person or specific environment, such as a school. In psychology, case studies are often confined to the study of a particular individual. This makes it clear that the case study is a method that should only be used by a psychologist, therapist or psychiatrist, i. There is an ethical issue of competence. Only someone qualified to diagnose and treat a person can conduct a formal case study relating to atypical i. The procedure used in a case study means that the researcher provides a description of the behavior. This comes from interviews and other sources, such as observation. The client also reports detail of events from his or her point of view. The researcher then writes up the information from both sources above as the case study, and interprets the information. Interpreting the information means the researcher decides what to include or leave out. A good case study should always make clear which information is factual description and which is an inference or the opinion of the researcher. Strengths of Case Studies Provides detailed rich qualitative information. Provides insight for further research. Permitting investigation of otherwise impractical or unethical situations. Because of their in-depth, multi-sided approach case studies often shed light on aspects of human thinking and behavior that would be unethical or impractical to study in other ways. Research which only looks into the measurable aspects of human behavior is not likely to give us insights into the subjective dimension to experience which is so important to psychoanalytic and humanistic psychologists. Case studies are often used in exploratory research. They can help us generate new ideas that might be tested by other methods. The method is therefore important for psychologists who adopt a holistic point of view i. The results of the study are not generalizable because we can never know whether the case we have investigated is representative of the wider body of "similar" instances Because they are based on the analysis of qualitative i. This means that there is a lot of scope for observer bias and it could be that the subjective opinions of the psychologist intrude in the assessment of what the data means. For example, Freud has been criticized for producing case studies in which the information was sometimes distorted to fit the particular theories about behavior e. Sex Reassignment at Birth: Long-term Review and Clinical Implications. Analysis of a phobia of a five year old boy. How to reference this article:

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Chapter 2 : Case Study Method in Psychology | Simply Psychology

Whatever the exact steps of your human-centered design process, it will need to include research and exploration. You can present research in case studies as process-oriented chunks. This could mean photos of a wall covered with stickies, complex illustrations and structural sketches, or even data models and usability results.

There are substantial methodological differences between these approaches. Case selection and structure[edit] An average, or typical case, is often not the richest in information. In clarifying lines of history and causation it is more useful to select subjects that offer an interesting, unusual or particularly revealing set of circumstances. A case selection that is based on representativeness will seldom be able to produce these kinds of insights. When selecting a case for a case study, researchers will therefore use information-oriented sampling, as opposed to random sampling. Three types of cases may thus be distinguished for selection: Key cases Outlier cases Local knowledge cases Whatever the frame of reference for the choice of the subject of the case study key, outlier, local knowledge , there is a distinction to be made between the subject and the object of the case study. The subject is the "practical, historical unity" through which the theoretical focus of the study is being viewed. Thus, for example, if a researcher were interested in US resistance to communist expansion as a theoretical focus, then the Korean War might be taken to be the subject, the lens, the case study through which the theoretical focus, the object, could be viewed and explicated. Gary Thomas thus proposes a typology for the case study wherein purposes are first identified evaluative or exploratory , then approaches are delineated theory-testing, theory-building or illustrative , then processes are decided upon, with a principal choice being between whether the study is to be single or multiple, and choices also about whether the study is to be retrospective, snapshot or diachronic, and whether it is nested, parallel or sequential. The typology thus offers many permutations for case-study structure. These are, to a differentiable degree, similar to the case study in that many contain reviews of the relevant literature of the topic discussed in the thorough examination of an array of cases published to fit the criterion of the report being presented. These case reports can be thought of as brief case studies with a principal discussion of the new, presented case at hand that presents a novel interest. In a case where the market of any organisation is in a messy state, the agency will always seek to find out some of the reasons why the scenario is that way. They will have to gather information that may help them in solving such issues. For this to be fully achieved, one must be able to carry out a market research to establish where the problem is. This, therefore, calls for the different methods which can be used in a situation where one wants to conduct a marketing research. The organisations have to choose one of the available techniques so that they can thoroughly conduct their investigations. Some of the primary methods that would be used included interviews, surveys, focus groups, observations and in some cases use field trials. Types of case studies[edit] In public-relations research, three types of case studies are used: Under the more generalized category of case study exist several subdivisions, each of which is custom selected for use depending upon the goals of the investigator. These types of case study include the following: These are primarily descriptive studies. They typically utilize one or two instances of an event to show the existing situation. Illustrative case studies serve primarily to make the unfamiliar familiar and to give readers a common language about the topic in question. Exploratory or pilot case studies. These are condensed case studies performed before implementing a large scale investigation. Their basic function is to help identify questions and select types of measurement prior to the main investigation. The primary pitfall of this type of study is that initial findings may seem convincing enough to be released prematurely as conclusions. These serve to aggregate information from several sites collected at different times. The idea behind these studies is that the collection of past studies will allow for greater generalization without additional cost or time being expended on new, possibly repetitive studies. Critical instance case studies. These examine one or more sites either for the purpose of examining a situation of unique interest with little to no interest in generalization, or to call into question a highly generalized or universal assertion. This method is useful for answering cause and effect questions. Case studies in business[edit] At Harvard Law School In , Christopher Langdell departed from the traditional lecture-and-notes approach to teaching contract law and began using cases pled before

courts as the basis for class discussions. But organizational behavior cannot always be easily reduced to simple tests that prove something to be true or false. Reality may be an objective thing, but it is understood and interpreted by people who, in turn, act upon it, and so critical realism , which addresses the connection between the natural and social worlds, is a useful basis for analyzing the environment of and events within an organization. A critical case allows the following type of generalization: Falsification offers one of the most rigorous tests to which a scientific proposition can be subjected: Popper himself used the now famous example: The case study is well suited for identifying "black swans" because of its in-depth approach: The rejection consisted primarily of a conceptual experiment and later on a practical one. These experiments, with the benefit of hindsight, seem self-evident. In his experimental thinking, Galileo reasoned as follows: If the two objects are then stuck together into one, this object will have double the weight and will according to the Aristotelian view therefore fall faster than the two individual objects. This conclusion seemed contradictory to Galileo. The only way to avoid the contradiction was to eliminate weight as a determinant factor for acceleration in free fall. Rather, it was a matter of a single experiment, that is, a case study. The air pump made it possible to conduct the ultimate experiment, known by every pupil, whereby a coin or a piece of lead inside a vacuum tube falls with the same speed as a feather. What is especially worth noting, however, is that the matter was settled by an individual case due to the clever choice of the extremes of metal and feather. Random and large samples were at no time part of the picture. By selecting cases strategically in this manner one may arrive at case studies that allow generalization. The problem-based learning PBL movement offers an example. When used in non-business education and professional development, case studies are often referred to as critical incidents. Ethnography is the description, interpretation, and analysis of a culture or social group, through field research in the natural environment of the group being studied. One approach encourages researchers to compare horizontally, vertically, and temporally. Teaching case studies have been a highly popular pedagogical format in many fields ranging from business education to science education. Harvard Business School has been among the most prominent developers and users of teaching case studies. Additional relevant documentation, such as financial statements, time-lines, and short biographies, often referred to in the case study as exhibits, and multimedia supplements such as video-recordings of interviews with the case subject often accompany the case studies. Similarly, teaching case studies have become increasingly popular in science education. The National Center for Case Studies in Teaching Science has made a growing body of case studies available for classroom use, for university as well as secondary school coursework. Teaching case studies need not adhere strictly to the use of evidence, as they can be manipulated to satisfy educational needs. The generalizations from teaching case studies also may relate to pedagogical issues rather than the substance of the case being studied.

Chapter 3 : FEM - Case to case study design

Video: Case Study Design: Definition, Advantages & Disadvantages Often, research involves looking at large numbers of people. But sometimes, researchers want to look at just a few people in-depth.

An important proposal was made by Chow as round-trip path testing. Recently, Bogdanov and [5] and adapted by Binder [3]: It consists in deriving test Holcombe [4] proposed a method to derive test sequences sequences covering all round-trip paths in a finite state based on the all transitions criteria in the presence of machine FSMs. Based on a number of rather strong hierarchical statecharts. Through Ball et al. Based on a set of combinatorial algorithms that are specific to every data mutation operators proposed for object-oriented code we structure encapsulated in the class. However, none of the seed a significant number of faults in an implementation of above strategies have been systematically compared and we a specific container class. We then investigate the still have to investigate how well they can perform in effectiveness of four test teams at uncovering faults, based practice. Since all strategies black-box strategy such as category-partition testing. This are based on a number of explicit or implicit assumptions, increases the number of test cases to run â€"and therefore which are typically not fulfilled in real situations, it is the cost of testingâ€" and a cost-benefit analysis weighting necessary to investigate such questions by experimental the increase of testing effort and the likely gain in fault means. To run our case study, we selected a state-dependent Keywords class, seeded it with faults, based on a well-defined set of Class testing, State-based testing, Object-Oriented Software mutation operators, and asked a number of test teams to test Engineering, Object-Oriented Testing the resulting mutants using the round-trip path strategy. We then analyzed the fault detection effectiveness of each team 1 Introduction independently and examine why certain faults were difficult or impossible to detect and what mechanisms would enable In any object-oriented design, the behavior of some their detection. This led us to a proposal to combine the classes is state-dependent [7]. In those cases, as an aid to round-trip path strategy with another test technique: This resulted into additional testing their behavior with a UML statechart. Such state models cost that needs to be weighted against the gains in terms of have long been a basis to define testing techniques [2]. As further classes, which are commonplace in most systems. We discussed below, we alleviated that problem by performing realize that no one class can be deemed representative, in a careful, precise analysis of all live mutants and we then terms of testing results, of all possible state-dependent assessed the extent to which the mechanisms identified were classes and this affects the generalizability of our results. Another issue However, more than the numbers themselves, our was to ensure that the round-trip strategy was correctly investigation will focus on why certain faults were not applied by the test teams as we were assessing the strategy, detected, what are the recurring mechanisms explaining our not the ability of our teams to use the strategy properly. The Section 2 describes the case study set-up in detail, main limitation in doing so is practical and stems from the providing relevant details on the code used, the statechart, availability of test teams and the time-consuming analysis of and the way faults are seeded. Section 3 reports on the fault each and every fault that was not detected, as further detection effectiveness and describes which faults were not described below. Future research should investigate whether detected by most or all teams. Class diagram for the code under test sets ; 2. We can see Methods in SetIterator are the classic methods that there is no concurrency or state hierarchy in this implemented by an Iterator pattern [6]: First , Next , statechart. Statechart of Class OrdSet concurrent statecharts into extended state machines is called a transition tree as in Figure 3. The traversing along described elsewhere [4] and is out of the scope of this a path stops whenever the state encountered is already paper. Note that flattening a statechart is a pre-requisite present in the tree. When there are guard conditions on before the round-trip path strategy can be used, as discussed transitions and that these guards are a disjunction of terms, in [3]. We follow the algorithm proposed by Binder [3], chapter 7, p. This algorithm returning data member values and which are not affecting is adapted from the well-known W-method [5]. Each path in the object state, are not considered. No faults were seeded the tree needs to be covered by the test cases. The rationale in them and this allowed us to simplify the case study. Also, is that all transition tree paths cover together the round-trip the tree presented here is for an ordered set

of cardinality 2 paths1 in the statechart, hence the name of the test strategy. Larger cardinalities would require that, in some or missing transitions and all incorrect or missing output cases, sequences of operations be executed for triggering a actions, responses leading to incorrect output or system transition, e. It was not statechart of the class is available along with OCL guard deemed useful in our context to test with larger cardinalities conditions on the transitions , it is possible to automatically as we are not testing memory limitations or performance but derive a transition tree. The algorithm can follow a depth-first traversing of the A final tree node is either a final node in the statechart graph corresponding to the statechart. This implies that the overflow here or represents a state already encountered statechart be flattened if it contains superstates. All paths higher up in the transition tree. There are various ways the traversed are then represented under the form of a tree, statechart could be traversed with either a depth or breadth first search and, as a result, different transitions trees could 1 The round-trip paths of the statechart are all the paths starting and be generated [3]. Note that these transition trees, regardless ending with the same state and simple paths from the initial state to the of the way the statechart was traversed, will cover all round- final state. Transition Tree Used for Class Testing trip paths2. In Figure 3, the numbers labeling the final nodes transitions model the two cases where one is true and the indicate the order in which their corresponding path were other one false. Some transitions have no triggering events and, to avoid cluttering, we do not show guard conditions on the Faults were seeded according to a set of mutation tree from Resizing to Partially Filled or operators proposed by Kim et al. As a consequence, in the transition tree, these initially used in an experiment [11]. Some of these mutation transitions are not decorated with any method name or operators are general and can apply to all imperative condition. Two of those transitions lead to Overflow and programming languages e. Others are specific to object-oriented languages containing or connectors. In that particular situation, there e. While seeding our program with faults, we tried to cover all are two clauses in the guard condition and the two mutation operators in a balanced way given the constraints of the code. As a result we seeded 44 faults, covering 8 different mutation operators see Figure 4. This explains we positive bias in the results, faults were seeded randomly count 25 paths in the tree. They were then Mutant operators asked to develop test drivers based on the given transition tree and following the driver template. To minimize the time spent setting up the environment and run test cases we Figure 4. Seeded faults per mutation operator also provided scripts automating the execution of test cases Moreover, in order to obtain unbiased results, only faults e. All this not only ensured that possibly be found by running test cases were considered. Though the drivers varied changed with another one e. We therefore did not use this particular mutation i. Such faults should be addressed by systematic design and code reviews. The mutation operators are denoted by Section 3. Argument study in terms of fault detection rates. Next, in Section 3. Most of these operators are not specific to the 3. For instance, operators related to From Table 1, we can see that, on average, the four test inheritance such as Compatible Reference Type teams found The variation across teams will be clearly explained class in which faults are seeded OrdSet. The differences when we investigate specific mutants in Section 3. Now regarding the proportion of faults seeded per category is due the question is how to assess such a result. Though it to the characteristics of the class under study. For instance, appears, a priori, to be a good result, we need a baseline of the more methods with parameters of the same types or comparison. To do so, we generate random test sequences subtypes , the larger the number of potential AOC faults. We generate methods meet the required condition. Moreover, the system random transition trees of identical shapes i. Figure 3 and compute their effectiveness at killing mutants. The transition trees are random in the sense that methods 2. The methods affecting the object state. Parameter values are also course scope included traditional testing material i. The goal is to compare the results of our test strategy techniques related to object-oriented systems, including the with a comparable test suite that does not follow any round-trip path strategy. As they were knowledgeable about systematic strategy. This is clearly and significantly lower than the two lines that were swapped within a while loop. The average mutation score is even significantly assigning an element to this array as opposed to after the higher than the maximum score with random test sequences. Those particular statements happen to treat the We can then conclude that, as a systematic strategy, and case where the two sets being unionized have common factoring out the cost of testing assuming this is elements. Three teams out of four did not perform

unions of proportional to the number of test cases , round-trip path sets with common elements and, hence, did not detect testing is practically relevant. Though it is clear that a mutant At some point, one set has been entirely traversed Random and the other may contain remaining elements that are still Team 1 Team 2 Team 3 Team 4 average to be included in the union set. With mutant 2, if s2 is in the Killed 36 39 34 38 29 latter case then the mutant cannot be killed and this is what happened with 2 test teams. Mutation Scores for the round-trip path mutant is located and then kill it. The block of this loop has 4 distinct cases being treated by an if-then-else One mutant 9 was not found by any of the test teams. Three that it cannot be killed if the two sets are equal or if all mutants 2, 4, 13 were killed by 2 of the teams and 5 elements in s2 are smaller than those in s1. This is what mutants 8, 14, 15, 16 by 3 of the teams. Though overall occurred with two test teams and explains why they were test effectiveness is important, it is also crucial to not able to detect the mutant. We then Mutant 39 suggests that when performing operations generalize and conclude based on our detailed analysis. Such testing strategy is Let us start with mutant 9 that was missed by all the test common practice when using black-box techniques such as teams. The positions of common elements and characterized by maximum size of the difference set is the size of s1. Due to choices e. Recall that the mutation, it is wrongly initialized with the size of s2. In this than the size of s2. The mutation in but not in s1, and both in s1 and s2 is important. That particular loop searches for elements in s1 that are situations should be covered by testing:

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Chapter 4 : TORUS â€“ Case Studies | Transoft Solutions

1 Carleton University TR SCE Revised, April A Case Study Using the Round-Trip Strategy for State-Based Class Testing G. Antoniol, L. C. Briand#, M. Di Penta*, Y. Labiche# * Research.*

From XML view updates to relational view updates: This paper addresses the question of updating relational databases through XML views. Using query trees to capture the notions of selection, projection, nesting, grouping, and heterogeneous sets found throughout most XML query languages, we show how XML views expressed using query trees can be Using query trees to capture the notions of selection, projection, nesting, grouping, and heterogeneous sets found throughout most XML query languages, we show how XML views expressed using query trees can be mapped to a set of corresponding relational views. We then show how updates on the XML view are mapped to updates on the corresponding relational views. Existing work on updating relational views can then be leveraged to determine whether or not the relational views are updatable with respect to the relational updates, and if so, to translate the updates to the underlying relational database. Rundensteiner , " Updates over virtual XML views that wrap the relational data have not been well supported by current XML data management systems. This paper studies the problem of the existence of a correct relational update translation for a given view update. First, we propose a clean extended-source th First, we propose a clean extended-source theory to decide whether a translation mapping is correct. Then to answer the question of the existence of a correct map-ping, we classify a view update as either un-translatable, conditionally or unconditionally translatable under a given update translation policy. We design a graph-based algorithm to classify a given update into one of the three update categories based on schema knowledge extracted from the XML view and the relational base. This now represents a practi-cal approach that could be applied by any existing view update system in industry and in academic for analyzing the translatability of a given update statement before translation of it is attempted. XQuery is widely used for querying XML documents. These optimization rules are applicable for all XQuery expressions and are very useful e. The basic idea is to transform the XML Schema definition into a graph, which is extended to a graph representing the XQuery expression. The latter graph is used to delete subexpressions of the XQuery expression that are not used to retrieve the final result of the given XQuery expression. We further include experimental results that demonstrate the improvement of our optimization. Viglas - Journal of Computer Science and Technology , " We provide new techniques to efficiently support XML view updates specified in terms of We provide new techniques to efficiently support XML view updates specified in terms of XPath expressions with recursion and complex filters. Furthermore, many issues are still open even for relational view updates, and need to be explored. In response to these, we revise the update semantics to accommodate XML side effects based on the semantics of XML views, and present efficient algorithms to translate XML updates to relational view updates. Moreover, we propose a mild condition on SPJ views, and show that under this condition the analysis of deletions on relational views becomes PTIME while the insertion analysis is NP-complete. Finally, we present an experimental study to verify the effectiveness of our techniques. Though a complete solution, the restrictions posed in [32] are

Chapter 5 : Case Study Research Design - How to conduct a Case Study

A Case Study Using the Round-Trip Strategy for State-Based Class Testing the same design pattern. The C++ code is LOCs long 1 The round-trip paths of the.

Chapter 6 : Case study - Wikipedia

Case to case studies may be a convenient design when information is available for the sub class of cases used as controls. However, as in any case control study, investigators need to be very cautious and verify that exposure in the control group reflects accurately exposure in the source population for cases.

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Chapter 7 : 3 Ways to Do a Case Study - wikiHow

The Case Study as a Research Method Uses and Users of Information -- LIS D.1 -- Spring Introduction Case study research excels at bringing us to an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research.