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Haugbølle, Kim; Forman, Marianne

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SHAPING CONCEPTS, PRACTICES AND STRATEGIES: ARBITRATION AND EXPERT APPRAISALS ON DEFECTS

Kim Haugbølle

Danish Building Research Institute/Aalborg University, Denmark
khh@sbi.dk

Marianne Forman

Danish Building Research Institute/Aalborg University, Denmark
maf@sbi.dk

The purpose of this paper is to analyse how the concept of defects is being shaped by arbitration and expert appraisals along with construction practices and strategies. This study applies the social-constructivist concept of technological frames. The research design included participant observation, documentary methods and qualitative interviews. This paper will illustrate the interpretative flexibility of the concept of defects. The four interpretations are deviance as normalisation, deviance as leverage/liability, deviance as a random effect, and deviance as precedent. Further, the paper will demonstrate how defects are constructed through three processes: concrete negotiations on the gap between expectations and realisation, setting and applying game rules, and by producing structures in the shape of codes of conduct. Finally, this paper will argue that the construction of defects is the result of interaction between two dominant technological frames: the building frame and the juridico-legal frame. Consequently, the system of arbitration and expert appraisals along with construction practices and strategies is co-shaping a culture of deviance/defects that both intentionally prevent defects but simultaneously foster defects unintentionally.

KEYWORDS: defects, arbitration, constructivism, building process.

INTRODUCTION: A STICKY PROBLEM

Defects in construction, say it and everyone has a story to spill. Countless is the number of media reports on the issue with tearful reports from Mr and Mrs Denmark and their two small children live primetime on national television complaining about the property developer or contractor who deluded or even defrauded the family with a defective building.

Looking back in to the history of construction, the issue of defects has been a recurrent policy issue. A number of initiatives etc. have been attempted for the past 20-30 years, but except for the Building Defects Funds not much success has apparently been achieved in reducing the number and seriousness of defects. Thus, the issue reappears over and over again. Apparently, the issue of defects in construction is one of those sticky or unsolvable problems that keep coming back. So, is the construction industry simply incapable of improving its own practices and products like other industries, or do we need a better understanding of the 'fundamentals' of construction?

Recently, an action plan to half the number of defects was drafted by the Danish Enterprise and Construction Agency (2005) in close collaboration with all the actors of the construction industry. Although the action plan deals with a number of relevant issues, it tends to deal with the usual suspects: improved training, refined planning, elaborated control procedures etc. Not much attention is being paid to the institutions penetrating construction and their role in

limiting the devastating effects of defects. One of the significant institutions, when it comes to defects, is the Building and Construction Arbitration Court and the building expert inspections and surveys. Having turned 25 years old, the time seems ripe to explore what role arbitration and expert inspection and surveys plays with respect to defects in construction.

Only few studies of the arbitration exist in Denmark. One notable exemption is a recent study by Høgsted (2008, p. 4) concluding that:

- The direct incurred costs exceed 100 million DKK (15 million Euros) per year in the period 2000-2007.
- The number of legal disputes has increased about 50 % in the period 2000-2007 corrected for changes in turnover.
- Many small disputes dominate the cases in the arbitration court. Two-thirds of all disputes concerns claims of less than 0.5 million DKK, and 25 % concern claims of less than 100,000 DKK.
- Indicatively, the number of disputes involving partnering projects seems to be much lower than in traditional projects.

This article reports from a study on arbitration and expert inspections and surveys that was part of a larger three year study (2006-09) 'Defects in construction – strategies, behaviour and learning' financed by the Danish Enterprise and Construction Authority. The project was conducted in collaboration by the Danish Building Research Institute/Aalborg University, the Technical University of Denmark and Copenhagen Business School. The project included four studies on buildability of constructions, arbitration and expert appraisals, exemplary construction project management, and defects in an unpredictable context – the relationship between intention, action and result.

The structure of this paper is as follows. First, the paper introduces the research methodology of the study. Second, the paper presents the analysis of the social construction of defects. Third, the conclusion will summarise the findings of the study.

RESEARCH METHODOLOGY

Theoretical framework

This study applies the social-constructivist concept of technological frames developed by Bijker (1997) as part of the SCOT theory (Social Construction of Technology). The SCOT theory is a response to technological determinism, and it argues that technology does not determine human action. Rather, social actions and technologies mutually shape each other. Further, sociotechnical change can not be understood without understanding how technology is embedded in its context.

The theory includes three main parts. The first part of the theory is the sociological deconstruction of sociotechnical change by applying the two concepts of relevant social groups and interpretative flexibility developed earlier by Pinch & Bijker (1984) in their now classical study of the development of the bicycle. The interpretative flexibility means that an artefact has different meanings to different groups, which in turn generates different problems

to be solved. The second part of the theory is the analysis of the social construction of sociotechnical change by the processes of stabilisation and closure. The third part is the explanatory and generalising part of the theory by applying the concept of technological frames and inclusion (Bijker 1997).

The technological frame encompasses goals, key problems, problem-solving strategies, requirements, theories, tacit knowledge, testing procedures, design methods and criteria, user practice, perceived substitution function and exemplary artefacts. The technological frames guide thinking and interaction within and between the different relevant social groups. Three different configurations of technological frames can explain a sociotechnical development: 1) one dominant technological frame, 2) no dominant technological frame, and 3) more than one dominant technological frame.

In her now classical study of the disaster of the space shuttle Challenger, Vaughan (1996: 394) states:

'The Challenger disaster was an accident, the result of a mistake. What is important to remember from this case is not that individuals in organizations make mistakes, but that mistakes themselves are socially organized and systematically produced. Contradicting the rational choice theory behind the hypothesis of managers as amoral calculators, the tragedy has systemic origins that transcended individuals, organization, time, and geography. Its sources were neither extraordinary nor necessarily peculiar to NASA, as the amoral calculator hypothesis would lead us to believe. Instead, its origins were in routine and taken-for-granted aspects of organizational life that created a way of seeing that was simultaneously a way of not seeing'

Vaughan (1996) goes on to argue that three elements constitute a theory of the normalisation of deviance in organisations: the culture of production, the structural secrecy and the production of culture. Drawing on Vaughan (1996) and the concept of technological frames (Bijker, 1997), we would like to suggest to understand defects according to Figure 1.

Culture of production

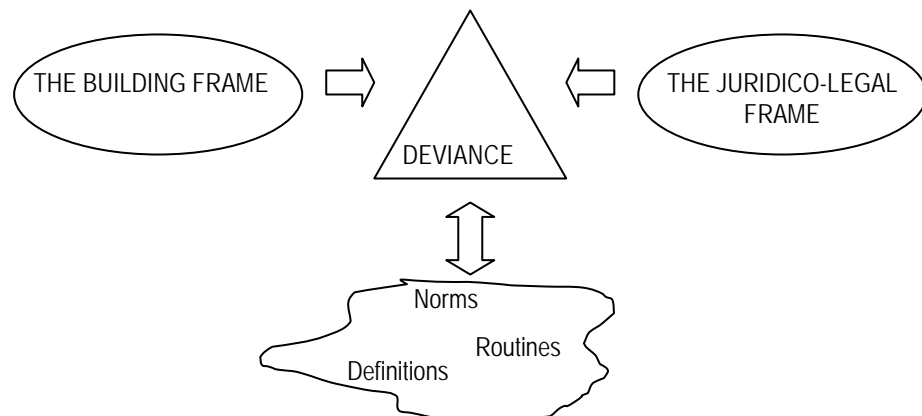


Figure 1. Analytical framework.

As illustrated in Figure 1, two different frames are shaping the concept of defects. The two frames are the building frame and the juridico-legal frame. The first frame is constituted by relevant social groups like building engineers, architects etc., construction technologies etc.

The second juridico-legal frame is constituted by relevant social groups like building experts, arbitration methods, arbitration courts etc.

In the following paragraphs, we will analyse how these two frames are mutually shaping the concept of defects along with the practices and strategies of firms operating within construction. We will follow/identify the controversies on 'defects' between the various relevant social groups in order to render the interpretative flexibility visible in relation to 'defects' as well as the processes that allow the controversies to be closed.

Building defects are considered as deviations from norms – an anomaly. The deviance is the object of an ongoing negotiation, where what is considered norms and what is considered as anomalies change over time and appears as the ongoing result of a mutual shaping process. Consequently, we will use the term 'deviance' rather than defects in our analysis to liberate ourselves from any of the connotations that is so deeply ingrained in the use of the term 'defects'.

Research design

This study used a variety of methods including participant observation, documentary methods and qualitative interviews.

First, participation observation in a two-day course for building experts in arbitration has given important knowledge on how the arbitration process is taking place, what tasks and duties the building expert is supposed to undertake, and how the building expert is being trained to conform to the code of conduct of a building expert in arbitration.

Second, documentary material has been obtained from various sources. The documentary material includes e.g. agreed documents, guidelines on arbitration, reports on arbitration and information on different types and procedures of conflict resolution.

Third, qualitative interviews have been conducted with the various actors of a construction project (client, consultant and contractor), a representative from the secretariat of the board of arbitration and arbitration experts. The interviews were carried out as semi-structured interviews and the themes included:

- What is perceived as defects, failures and shortcomings.
- Experience of using the court of arbitration and expert appraisals.
- Effect of the use and judgements on the firm's practice and strategies.

The interviews were recorded and transcribed in full. Eventually, the interviewees had the opportunity to comment on the transcripts. Subsequently, the interviews were analysed using a meaning condensation approach, rather than a narrative, interpretative or categorisation approach (Denzin & Lincoln, 1994; Kvale 1996).

CONSTRUCTING DEFECTS – DEFECTS IN CONSTRUCTION

The Danish Building and Construction Arbitration Court was established at January 1 1973. The Building and Construction Arbitration Court facilitates dispute resolutions within building and construction according to the agreed documents for construction works, design-

build and consulting services covered by AB92, ABT93 and ABR89 along with the statute of the board. Other dispute resolutions or legal measures also exist like approved appeal tribunals, private lawsuits etc. The secretariat of the arbitration board is responsible for the administration of the activities of the arbitration board, including liaison between the opponents, lawyers, building experts, arbitrators etc. The arbitration board encompasses the following dispute resolution methods: Inspection and survey by experts, expert opinions on security provided etc., normal or simplified arbitration, pre-emptive conflict resolution, conciliation and mediation.

The liabilities of consultants and contractors are usually defined according to the agreed documents ABR89, AB92 and ABT93. When it comes to errors and negligences, the consultant are liable for damage occurring in connection with work assumed by him when such damage is the result of a lack of the necessary professional skill or care. The consultant cannot be held liable for damage arising from conditions which cannot be considered generally known in professional circles, for accidental damages, or for errors committed by the client or by others engaged by the latter (National Building Agency & Danish Association of Consulting Engineers, 1989). The liabilities of contractors are defined by the agreed document AB92 General Conditions for the provision of works and supplies within building and engineering (Danish Ministry of Housing, 1992, p. 9):

'§ 30. If the work has not been performed in accordance with the contract, with due professional care and skill or in accordance with any instructions given by the employer under § 15, it shall be deemed to be defective. The same shall apply whenever the contractor has failed to provide other services agreed upon in relation to the work.'

Let us start the analysis with some empirical observations on the number of defects. This is exemplified by the pattern of dispute resolution in one of the case firms (see Figure 2).

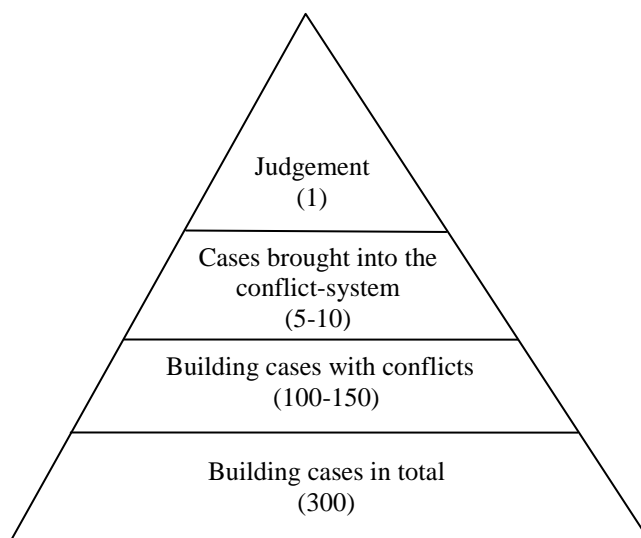


Figure 2: The dispute hierarchy in a construction firm. Source: Forman & Haugbølle (forthcoming).

The numbers in brackets refers to the number of building projects per year. These numbers are taking from a large consultancy firm. Clearly, the absolute numbers will depend on the size of the firm. Further, the numbers will depend on the type of firm in question. For example, the number of legal cases at a contractor is typically higher. In the contracting firm

some 30-40 building projects per year was the norm. Now, the exact numbers are not that important. What matters is the scale or magnitude of disputes.

In the following four subchapters, we will deconstruct the interpretative flexibility of the concept of defects starting from the bottom and moving upwards. Further, we will move on to analyse the social construction of defects at three levels: the concrete negotiations, ground rules and structures. Finally, we will explain it by reference to two technological frames.

First interpretation: 'normalisation of deviance'

In Figure 2, the total number of building projects in one of our case firms of a major consultancy is estimated at a total of some 300 building projects per year. Of these 300 projects, about half of them will be finalised with revisions, modifications and alterations, but without any grave disagreements that would involve some measure of conflict resolution.

The execution of these building projects is predominantly being shaped by the building frame with its associated relevant social groups of architects, engineers and contractors, building technologies, design methods etc. This is not to say that the juridico-legal frame is not shaping the activities, but the juridico-legal frame reigns in silence and is mostly only directly activated when signing the contracts by the signatory powers and legal officers of the involved firms.

At the level of concrete negotiations, the actors will use e.g. project meetings, site meetings or a walk-through of the site to discuss and debate the progress of the building project and whether a design solution or the workmanship conform to general performance standards e.g. issued by the Danish Building Research Institute, Danish Standards or similar. At this concrete level, there is a constant check of solutions and performance against a more or less well-defined backdrop of what counts as satisfactory. The actors share a common perception of the expected outcome and what counts as a proper code of conduct. Thus, the gap between expectations and outcome is rather small. This is not to say that e.g. the contractor does not need to redo work and the consultant will need to redesign solutions, but there is a ready acceptance of the need to redo work since it is considered to be fair and reasonable. But revisions, modifications or alterations are viewed as an integral part of project based work. Thus, all actors of the building process expect the process to be an iterative process where changes are constantly made. An integral part of working in projects developing buildings is to recognise that no one solution exists at the outset. Rather, having numerous alternative roads ahead as well as final results is fundamental to building. Further, numerous interpretations of building brief, drawings, descriptions etc. have to be made during the course of a building project in order to produce the final product.

At the level of rules of the game, the actors readily accepts a playing field formed by the phase model and the agreed documents for construction works, design-build and consulting services covered by AB92, ABT93 and ABR89. Having signed a contract according to the agreed documents also implies acceptance of de facto fulfilling the contract even if that entails the need to redo work without obstruction, additional payment etc.

At the structural level, the interaction of actors produces a norm or code of conduct of what counts as 'normal practice'. This norm is productive in two ways. First, within a broad scope the norm sets the standard for what counts as satisfactory design and workmanship. Second, the code of conduct acknowledges the need for revisions and modifications as business as usual. Consequently, deviances become the norm, very similar to the processes described by

Vaughan (1996) in her now classical study of the disaster of the space shuttle Challenger. In fact, an argument often raised in the policy debate on defects is that these revisions and modifications should *not* count as defects since they are an integral part of the project team becoming wiser as the project moves on. Thus, our first observation is related to what could be coined the 'normalisation of deviance'.

Second interpretation: 'deviance as leverage/liability'

Moving up one step of the ladder in Figure 2 marks a significant shift in the interpretation of the concept of defects. According to our interview persons, the firm is likely to experience disagreements and disputes in up to half of its 300 building projects that require some level of legal action in order to cope with the disputes.

At the level of concrete negotiations, these disputes may concern all possible aspects of the building project: extensions of time limits and delays, extra payments for additional work, errors and negligences on behalf of the consultant, insufficient workmanship etc. These disputes may be resolved in various ways. It is however characteristic that in order to settle the disputes some measure of legal action is required. This may be in the form of e.g. letters of formal notice, involvement of some kind of dispute resolution board, replacement of personnel, withholding payments or having parts of work being done by others. The solution in each building project may differ from the next, but essentially the resolutions are drawn from a commonly known pool of options.

At the level of rules of the game, these disputes are managed internally in the project or possibly between firms at the level of senior executives. But external building experts or the court of arbitration are seldom directly involved in solving the disputes. This is not to say that the legal system of arbitration is not playing a role. Indeed, the concrete negotiations taken place between the actors will often make use of the rules of the game by referring to the agreed documents, contracts etc. in order to make e.g. the contractor comply with what the client and consultant consider appropriate. In this respect arbitration is used as a leverage to further the interest of one actor towards another actor in the building process. Thus, it acts as a ground rule for dealing with defects.

In most cases, the settlement of disputes is postponed until the project is finished and the hand-over is or has taken place. In another paper, Forman and Haugbølle (forthcoming) have argued that this constitutes a double-strategy on behalf of the construction companies. Although progress of the building project is imperative, both parties in the dispute will start putting together as many claims as possible against the opponent.

At the structural level, the interaction of actors of both the building frame and the juridico-legal frame produces a norm or code of conduct of what counts as 'defective practice'. Although all actors of the building process expect the process to be an iterative process where changes and deviations from the intentions of the plan are constantly made, deviance is no longer just viewed as normal practice. Rather, accusations of bad workmanship, defective designs, bad intentions etc. are now filling the air. Deviances are now considered to be detrimental to the objectives and intentions of the building project, and they are no longer deemed excusable and immediately being rectified by the responsible actor by own code of conduct. On the contrary, we are now close to the amoral calculator hypothesis as described by Vaughan (1996).

Summing up, the execution of this group of building projects is no longer predominantly being shaped by the building frame alone. Rather, the juridico-legal frame becomes more prominent in the shaping of the course of building projects and the interpretations of what counts as a defect. Thus, defects may act as tactical negotiation resources that can be used as leverage or be a liability in the settlement of payment of each party. Consequently, disputes and defects are no longer so much about e.g. the building technical content as it is a matter of payment. Thus, a seemingly technical defect on e.g. poor workmanship, defective products, reduced technical performance of a construction is being translated (Latour 1987) into a liability/leverage and further into an issue of payment.

Third interpretation: 'deviance as a random effect'

Taking one step further up the ladder of Figure 2 denotes another significant shift in the interpretation of defects in construction. Figure 2 illustrates that in a rather small number – some 5-10 building projects per year – disagreements escalate into a literally legal dispute where arbitration and building experts are directly brought into play. Again, these disputes may concern all possible aspects of the building project: extensions of time limits and delays, extra payments for additional work, errors and negligences on behalf of the consultant, insufficient workmanship by the contractor etc.

At the level of concrete negotiations, disputes are no longer managed internally in the project or possibly between firms at the level of senior executives. Rather, external building experts or the court of arbitration are being directly involved in settling the disputes. Thus, the shaping of the concept of defects by the building frame is now to a much larger extent being directly shaped by the presence of the juridico-legal frame. A core challenge facing the actors is the selection of expert and appraisal themes along with the state of evidence (notably documentation) is crucial to what will be defined as a defect at the level of concrete negotiations.

When it comes to the rules of the game, the third level in the dispute hierarchy marks a significant shift in the course of events. An interview person expresses it this way: 'Bad blood has entered the project'. However, this does not entail that the project is being held up or stopped normally. Rather, the imperative of the building frame is still progress. Thus, the project will not be held up (at least not for long) but a building expert may be summoned to ensure the necessary evidence related to the dispute. In most cases, the examination and opinion of the building expert will form the backdrop for a settlement of the dispute before it is taken to the court of arbitration. The secrecy of settlements and the use of defects as a tactical negotiation resource by project participants are setting the ground rules for coping with defects.

In most cases, the settlement of disputes is postponed until the project is finished and the hand-over is or has taken place. In another paper, Forman and Haugbølle (forthcoming) have argued that this constitutes a double-strategy on behalf of the construction companies. Although progress of the building project is imperative, both parties in the dispute will start putting together as many claims as possible against the opponent.

At the structural level, the contested nature of defects displayed by the open adversarial relation between the actors of the building process along with the secrecy of the out-of-court settlements and the importance of the selection of building expert and appraisal theme produces an image of the verdicts and closure of disputes as being a random effect. Although the wordings of each of our interview persons are different, one quote nicely captures the

perception among building professionals of arbitration and building expert surveys: 'It is simply a lottery'. Whether this is true in any 'objective' sense, is not really that important. The important issue is how the actors perceive defects and arbitration, and how the actors act correspondingly to cope with this uncertainty and randomness.

Fourth interpretation: 'deviance as precedent'

Of the rather small number of building projects escalating into a legal dispute where a building expert or other dispute resolution methods are brought into play, Figure 2 illustrates that no more than a few building project per year is likely to be taken to the court of arbitration for judgement. Again, these disputes may concern all possible aspects of the building project: extensions of time limits and delays, extra payments for additional work, errors and negligences on behalf of the consultant, insufficient workmanship by the contractor etc.

Disputes are now staged predominantly by the juridico-legal frame. Thus the game rules have altered significantly. What started out as a disagreement in a building *project* has now turned into a legal *case*. Further, the time frame has changed dramatically from that of a more or less fixed deadline for the handing-over of the final building to the legal statute of limitations. A significant shift in actors or relevant social groups has also occurred. First, building experts, lawyers, insurance companies, legal officers and arbitrators are the prominent actors. Second, although the building professionals still have a role to play, their roles as project manager, consultants, contractor etc. has now been redefined as the roles as plaintiff and defendant as well as witnesses to be called to the stand. In this respect the building frame has been subordinated to that of the juridico-legal frame.

Consequently, the concrete negotiations have moved in to the courtroom, where the lawyers will litigate for their clients. The lawyers will do their best to 'establish fact' on compliance or non-compliance on the issue in question. A key item of this process is the ability of the respective parties to make a good case based on the documentation at hand. Or as one interview person bluntly puts it: 'It is not about being right, it is about *proving* that you are right.'

Another key item is the questioning of the statements made by the building expert. It is worth noting however that the inspection and survey report done by the building expert can not be appealed to other courts. Thus, one of our interview firms is considering whether it would be more appropriate to skip the provisions in the agreed documents on the arbitration court (for private clients only) and have the cases judged in civil-court instead, where appeals are possible and the building expert can be countered by other experts. Another important observation is that the insurance companies are often pushing hard for a judgement in the arbitration court.

What is the structural implication hereof? The concept of defects is now predominantly being shaped by the juridico-legal frame. Reaching a verdict or judgement presupposes a definition of what counts as 'normal practice'. A practice carried by, described by and assessed by the building expert summoned by the court of arbitration as the expert. A practice that is not only open for interpretations but also contested (this is exactly why the particular dispute ended up as a legal case in the first place!).

Two observations are important here. First, the use of normal building practice as benchmark rather than best practice effectively forms structures that lock construction into the current

state of affairs. An example of the implication hereof was given by a client complaining that even a very high number of less grave defects would not justify the rejection of the takeover of a building. As the interview person put it: 'Even 10,000 paint spots are not enough'. Second, the interest and push by insurance companies for judgements in arbitration court is closely linked to safeguard the insurance policies, insurance premiums, insurance cover, insurance clauses etc. Thus, the insurance companies as well as public construction clients (being obliged by law to do so) will seek to create a precedent in order to define what counts as compliance and non-compliance.

CONCLUSIONS

In a schematic sense our core argument throughout this paper looks like this: Institutions like the legal system of arbitration is co-forming norms for performance, code of conduct etc. These norms along with other forces shape the behaviour of actors. The behaviour produces results and (sometimes) defects. In turn, the defects stimulate learning – correct or not (Kreiner & Damkjær, forthcoming). The lessons learned either maintains existing behaviour or re-shapes a new behaviour. The behaviour will reinforce norms for performance, code of conduct etc. In turn, the norms establish the foundation for institutions like arbitration.

This paper has illustrated the interpretative flexibility of the concept of defects or deviance, as we would prefer it. The four interpretations are deviance as normalisation, deviance as leverage/liability, deviance as a random effect, and deviance as precedent. Further, we have demonstrated how defects are constructed through three main processes: concrete negotiations on the gap between expectations and realisation, setting and applying ground rules for the game, and by producing structures in the shape of norms or codes of conduct. Finally, we have argued that the construction of defects is the result of interaction between two dominant technological frames: the building frame and the juridico-legal frame. Consequently, the system of arbitration and expert appraisals along with construction practices and strategies is co-shaping a culture of deviance/defects that both intentionally prevent defects but simultaneously foster defects unintentionally.

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