COGNITIVE MAPPING FOR DECISION MAKING: IMPROVING GROUP INTERACTION IN GOOGLE'S YOUTUBE CUSTOMER SERVICE IN INDIA

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ABSTRACT

This work aimed to show that cause and effect cognitive mapping methodologies such as influence diagrams can improve decisions in the online entertainment industry. In the first part of the paper, the authors reviewed decision-making and problem-solving techniques such as Strategic Options Development and Analysis (SODA) and Soft System Methodology (SSM), and asserted their role for being the foundations for the development of the Influence Diagram methodology used in this paper. The work argued that by using Influence Diagrams managers can improve problem situations and lead to better decisions when one deals with causality over time. The writers maintained that influence diagrams employed under conditions of causality have the capacity to turn a problem situation from chaos into order through a real-world example from Google's YouTube Customer Service Department in India presently faced with staff turnover. The reader will be able to perceive graphically how the flow of work had gone wrong at Google's YouTube due to limiting worker autonomy. The researchers intervened by introducing specific policies recommended of Influence Diagrams, that, apparently, smoothed the various relationships among decision agents, controlled the problem situation, and improved work flow. The authors deemed that these diagrammatical loops and the dynamic linkages amid variables, had the advantage of presenting visibly a problem situation and therefore helped decision makers understand the problem situation and find a way out of harried decision-making complications.

Keywords: Problem-Solving, Decision-Making, Management, India, World.

JEL Classification: M14, M16, Y20

INTRODUCTION

Cognitive mapping is a practical instrument allowing to comprehend the mental exemplifications of a person or group at a specific instant (Eden, 1988). A cognitive map represents the course of thinking about a problem following a process of mapping (Eden, 2004). The cognitive mapping technique seems to have the ability of diminishing favoritism as it allows enclosing offered decision substitutes in the decision-making process in organizations (Sutrisna and Barrett, 2007). The outcome is that decision makers would reason harder in treating the existing data in forming decisions. Therefore, it is maintained that the cognitive mapping tool can support decision makers in linking various causes that are related to a problem situation (Yusnaini, Hakiki, and Wahyudi, 2024). The benefits of using cognitive mapping for decision making are notable. First of all, cognitive maps are capable of improving attention and activating memory/. In addition, they may assist highpoint urgencies and vital issues and they can produce omitted facts. Most importantly, cognitive maps may

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also disclose breaks in data or thinking which deserve immediate responses (Fiol and Huff, 1992).

The above-mentioned benefits seem to make cognitive maps proper for taking decisions in organizations. Swan tested the practice of cognitive mapping in taking industrial innovation choices in a number of industries including banking and financial services with positive results (Siau and Tan, 2005b; Boland and Tenkasi, 1995). However, the method is not commonly applied to improve decision making in the online entertainment industry (Siau and Tan, 2005b). With strategy struggling to apprehend executives' strategic choices and consumers' judgements, it appears surprising to realize the shortage of practical applications employing cognitive mapping to reach an understanding of mental exemplifications in business decisions in the online entertainment industry (Rosalie and Paradas, 2022). The present paper attempts to relate how the method may be applied in the online entertainment industry with reference to Google's YouTube customer service department in India.

Cognitive Maps and Rich Pictures

The cognitive mapping method was initially introduced in psychology by Tolman (Tolman, 1948). Tolman established an alternate stimulus-response model for individuals (Eden, 1992). As per Tolman, in cognitive mapping it is assumed that a cognitive map is a model of cognition (Tolman, 1948). However, as the product of a cognitive mapping method in the present work is typically stated as a cognitive map, that might create a misunderstanding in relation to the term employed in psychology. To escape any such misunderstanding, the researchers will use the term "cognitive maps" to utterly denote the products of cognitive mapping in the subsequent parts of the present study. Past research tested the effect of cognitive mapping to get over perceptive biases produced by pictorially outlining the data embraced by the decision makers. The cognitive mapping method employed in these studies was causal cognitive mapping, - that is the mapping of underlying associations that designate forms of interrelationships among variables that affected decision results (Hodgkinson et al, 1999; Oliveira, 2020). It is also argued that, in Cognitive Mapping the tough work of an individual to reason prior to taking a judgment out of many decision options, can remove any discrimination that may arise in the process of taking the decision (Huff, 1990). To put it simply, by applying the method Huff observed that there was a rise in the quality of the decisions that were taken in these instances as it eliminated bias completely (Huff, 1990). A number of issues that also differentiated this study from other research were the adjustments to the study tools used, which in Huff's work included the use of computer simulation. Cognitive maps constructed in this way by subsequent researchers have suggested that computer simulations may help understand the process of decision making (Sweatman, Wake, and Cooper, 2011; Swan, 1997).

However, when it comes to cognitive maps for corporate practice, Eden and Ackermann argue that cognitive mapping must go together with the specific organizational identities (Eden and Ackermann, 1993). For these writers, in addition to offering a source for action, the different organizational identities epitomize a way of opening up opportunities for strategic change and rebirth. Managers have to be awake and to be able to bring alterations in each of the cognitive maps. However, research shows that it is not likely that all of these maps will be possible to change at the same timing as human reasoning is evolving (Baddeley, 1992; Giddens, 1991). This means that cognitive mapping seems to be a dynamic process that develops over time as it involves constant change, which is uncertain if it can be depicted in a computer simulation. It is suggested therefore, for cognitive maps to be effective in an

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organizational setting, managers must find a means through which they can identify and categorize which cognitive maps are fluctuating, and at what rate they are changing (Yusnaini, Hakiki and Maryati, 2024; Huxham and Eden, 1990; Eden, 1987). To make this possible, the authors of the present paper will argue that human intervention and collective reasoning in a group setting may be the solution. Therefore, for the purposes of the present work for Google's YouTube Customer Service Department, the researchers will work with the assumption that this holds to be true and the authors will make use of this observation.

To take this further, cognitive mapping techniques may also be used in the area of conceptual modelling (Schneider and Shiffrin, 1977). Siau and Tan (2005a) researched the application of cognitive mapping methods to heighten the value of conceptual modeling. They have developed a case to show the benefits of employing cognitive maps to complement industry oriented Soft Systems Methodology (SSM) (Siau and Tan, 2005a). The authors show that cognitive maps can work together with rich pictures in SSM. Rich pictures are employed in SSM to describe a situation, identify problem situations, and suggest solutions to problem situations (Hanafizadeh, Mehrabioun and Mostasharirad, 2021; Checkland, 1981). A rich picture is in fact a graphic caricature of a company and works to illustrate what the problem situation in the organization is all about (Checkland and Scholes, 1990; Avison and Fitzgerald, 1995). In the past rich pictures was extensively used by Peter Checkland in ICI Petrochemicals and they have proved to be useful in successfully identifying hidden operational problems (Checkland and Poulter, 2006). Similar findings resulted of using rich pictures to identify obstacles in taking decisions in the New Zealand dairy industry (Reid et al, 1999) and in the South African sugar industry (Proches and Bodhanya, 2017). In SSM an IT system analyst or a project manager, or anyone in the business, may draw a rich picture by looking at the actions and decisions of diverse people or by interviewing different stakeholders. In addition, as with cognitive maps, rich pictures have been employed to illustrate complex problem situations (Buzan, 1993). These pictographic drawings try to seizure the real situation in excess of a free of limitations, picture of all the opinions stated before now by the members of an SSM project, plan, systems, relations, effects, cause-and-effect, and so on (Checkland and Winter, 2006). Those illustrative sketches seem to exemplify individual matters such as the dispositions of the diverse contributors in a problem-solving situation and their physiognomies, their beliefs and presumptions, their inner self and their social nature (Ebrahimi, 2020). For example, if an editor of a journal who is working for a imaginary business, - in our work let's call it the DF publishing house, - is busy in identifying material to include in his book he or she may need to try to draw rich pictures of his/her perceptions, at least initially, and has to do this from the point of view of the client instead of focusing on his/her own perception of the situation (Checkland and Winter, 2006). As an instance, if a rich picture could be produced by this imaginary editor in our example, would look as follows:

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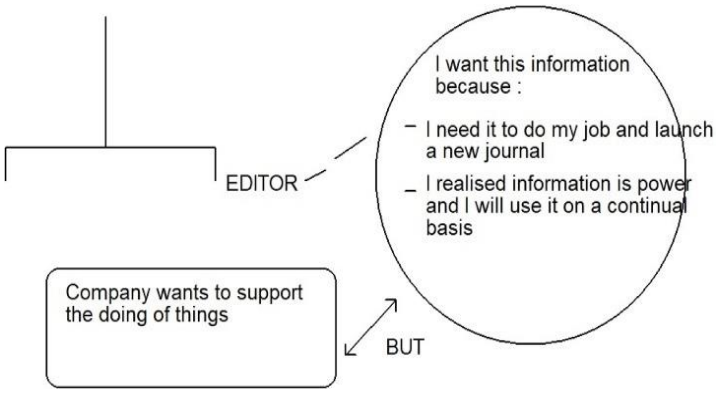

FIGURE 1
EXAMPLE OF A RICH PICTURE FOR DF PUBLISHING HOUSE

In Figure 1 the individual editor who, presumably, would had constructed this rich picture seems to have identified all of his / her needs by considering the client as well as his / her company's views of the problem situation. In this respect, the rich picture drawn., apparently, takes all views into consideration. Checkland and Holwell (1998) argue that the same may be happening in a group decision making situation in which every one of the members of the team has divergent thoughts and ideas regarding a particular problem situation. In such a setting, ideas can be identified and illustrated and the conceptions of the participants as well as of the clients and other stakeholders can be included in the rich picture (Checkland and Holwell, 1998). As the reader can see in Figure 1 concepts are connected with arrows, which in essence shows causality. However, an almost similar process seems to be followed in drafting cognitive maps. The cognitive maps are a web of nodes and arrows as links (a specific kind of `focused graph'), in which the course of the arrow indicates a supposed causality, although this causality is apparently meant to capture the situation in a specific moment (Eden, 2004). This issue is discussed more below in this paper as it seems to be a weakness of the model when one considers cognitive maps as described by Eden over time. To continue with causality, however, the similarity between rich pictures and cognitive maps is obvious (Soesanto, 2021; Fanke, 2013). Therefore, in addition to overcoming some limits of human cognition, cognitive maps, as with rich pictures, seem also capable of cherishing the apprehensions of different parties and share them in a group. The remodeled acceptance systems, as epitomized by cognitive maps, assist to make the diverse perceptions of the participants clear, and thus easier to comprehend (Orlikowski, 2000). What is also important to stress at this point, is that the three most significant parts of a rich picture in SSM are structure, process, and concerns, that are employed to detect two chief characteristics of the human activity system – primary responsibilities and apprehensions – which are also the requirements in cognitive mapping (Monk & Howard, 1998; Diffenbach,1982).

To compare the two methods, the researchers here have constructed a suggestive cognitive map for the hypothetical DF publishing house. Figure 2 shows how knowledge would have been developed in relation to the editor's need for information depicted in the rich picture in Figure 1. During the construction of the map the assumed editor would had thought what would have been the implications of having full information about client requirements and market trends. For example, by observing the cognitive map in Figure 2 one can see what the editor would think is needed in order to establish better customer/marketing culture opportunities. In this map actions to be taken are described by nodes and each node connects with the next action to be taken through an arrow. Some of the nodes in the map in

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Figure 2 describe precisely the action to be taken (nodes 2, 3, 4, 6, 8, 9, 11. 12, 14, 15, 16, 19) whereas some others state the action as well as the consequences of not taking that particular action (nodes 1, 5, 7, 10. 13, 17, 18, 20, 21). In that respect cognitive maps seem to initiate action. Starting from Node 1 and going up to Node 21 the editor would have mapped in a logical fashion the sequence of actions that he or she thinks are needed in order to take advantage of having more information about the market and his or her customers. The cognitive map in Figure 2 it is suggested to have been made by the editor himself. However, the reader needs to figure out that even though cognitive maps can express the knowledge of one participant, it is necessary for more people to intervene and discuss and/or influence actions. Eden argues that in real-life decision-making cases individual self-regard typically coming of either senior managers or shareholder precedence obstruct the decision taken from seeing the broader picture and goes on to argue that a wider participation in taking a decision through cognitive mapping is needed (Eden, 1987).

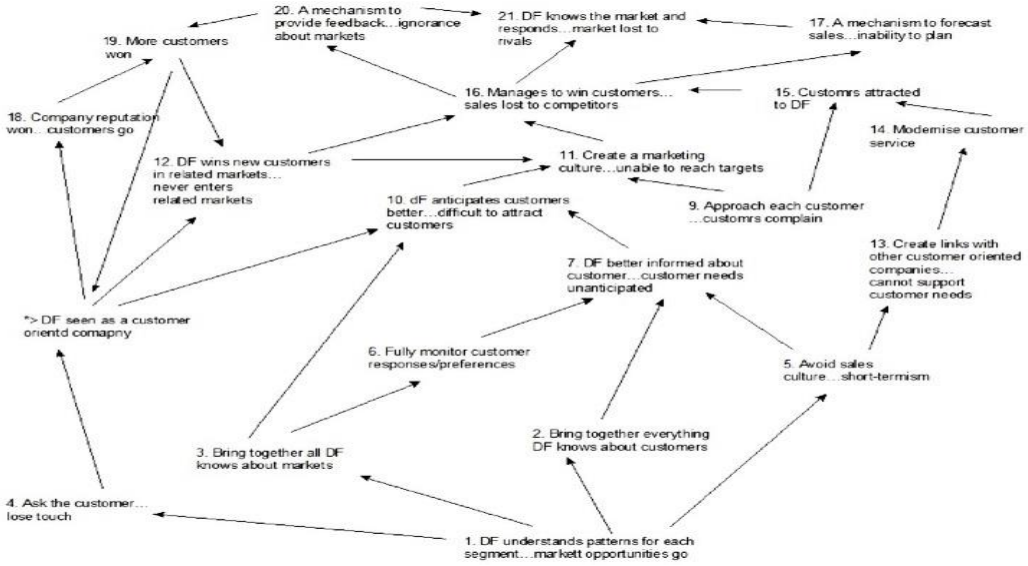

FIGURE 2
OUTPUT OF A COGNITIVE MAP FOR THE DF PUBLISHING HOUSE

In this sense, it is to be noted, cognitive maps should be completed in a process of discussion, which supports the assertion made by the authors of the present work above that human intervention and collective reasoning is needed. Research shows that in a real situation, decision making occurs in circumstances of intricacy, where the most challenging and difficult job is to express the nature of the problem, instead of its solutions (Rosenhead and Mingers 2001). Handling management decisions in this situation means rendering and responding to the fluidity of interrelated issues and concepts of the real world, and this seemingly needs extensive human participation and interactions in the decision-making process (Checkland, 2001). If this is true, then it seems that there is no single explanation of the problem, but each separate person has his or her own viewpoint in describing and assessing a problem situation. The taking or not taking of an action can of course first be conceived by the person who has drawn the map but afterwards it would be necessary to bring the map to the whole group of those concerned discussing the implications of these actions and whether or not these implications of actions call for a process of revisions (Ferrell, 1985). Usually, the drafting of cognitive maps is done by human interaction assisted by specialized software (Soetanto and Goodier, 2013; Abuabara and Paucar-Caceres, 2021). Such software generated representation of cognitive maps are done widely across the world

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from agriculture (Elsawah et al, 2015; Tröger et al, 2018) to airline catering services (Smart and Dudas, 2007), primary schools (Sørensen and Vidal, 2002), wind energy (Upham and Perez, 2015), financial services (Ferreira, Santos, Rodrigues, and Spahr, 2014), and foundry (Swan, 1995). However, in the study for Google's YouTube customer Service Department although the authors make use of cause-and-effect maps, they follow the same philosophy that characterizes the rich picture model, that is, the maps are handmade illustrations. Research in psychology shows that handmade pictorial representations of a problem situation depict more naturally the participant's inner self in describing the problem situation in itself (Huysman, 2002; Kling, 1992; Wenger, 2000).

Influence Diagrams for Cognitive Mapping

An additional issue that the authors faced in the present analysis of Google's YouTube Customer Service Department below is that as per Eden's definition of Cognitive Maps discussed above (Eden, 2004), the nodes do not seem to signify variables directing their values in well-organized groups and the arcs do not seem to be causal suppositions (Giordano et al, 2007). The presence of a link amid A and B means that "*if A is correct then B is correct*". This does not seem to necessarily imply cause and effect relationships (Ge, Planas, and Er, 2010). Consequently, the writers here will argue that causal implication to evaluate effects of strategy choices seems not to be possible using the Cognitive Maps model as demarcated by Eden. Additionally, the uncertainties in system dynamics seem not to be considered in the model (Giordano et al, 2007). In case an arc is meant as a consequence, the cycle "*A infers B, and B infers A*" just means that if A is correct then B is correct, if A is untrue then B is untrue. Time seems not to be applicable in this context, nor constancy and nor volatility over time (Marchant, 1999). Hence, the writers of the present study will consider that cognitive maps as suggested by Eden (2004) seem not to be capable to back decision making by modelling the effects of likely actions in diverse situations over time and change. Instead, what appears to be the case is that the analysis of cognitive maps as suggested by Eden (2004) certainly supports insightful thinking in problem solving, provided that time restrictions related to the suggestive actions proposed in a cognitive map do not exist and the environment is stable, - which in real situations does not always seems to be the case (Giordano et al, 2007).

To deal with the problem of making sure that there is a cause for every effect, the present study has chosen to work with a variation of Cognitive Mapping, that is, the authors will make use of influence diagrams for cognitive mapping. An influence diagram is a focused graph that signifies the cause-and-effect relationships over time under constant and unpredictable change rooted in members' thinking in a group decision making situation (Nadkarni and Shenoy, 2004). In that respect, influence diagrams make the assertion that specific happenings or activities will take us to probably results which will be valid and true over time under conditions of unpredictability (Seel, 2006). Moreover, it is to be noted, that the components of an influence diagram are three: causal concepts, causal connections and causal values. Each concept signifies a complete unit, a situation, a variable, or a feature of the system (Xirogiannis et al., 2004). A causal linkage portrays a precursor consequential relationship between two concepts. In other words, a causal value in such influence diagrams epitomizes the power of a causal relationship and how it develops over time by always taking change into consideration (Nadkarni and Shenoy, 2004). Nevertheless, the authors of the present study are indebted to Cognitive Maps as developed by Eden (1992) and Rich Pictures as established by Checkland (2001) as these tools have helped the writers here to conceive

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the limitations with causality over time and volatility and work more to develop the concept of Influence Diagrams in the sense that is employed in the present study, that is by taking into consideration causality over time and unpredictability in the models

In constructing an influence diagram, one is searching for feedback loops ("*closed-loop thinking"*). Identifying feedback loops is a central action in systems thinking as feedback loops are what is causing a system to alter its behaviour over time (and most of the times in unanticipated manner) (Al-Diban, 2008). One must distinguish amid two types of feedback loops: degenerative (or adverse) feedback loops and regenerative (or constructive) feedback loops (Hansen, Shi, and Kastrantas, 2022). To explain this more, a causal influence diagram is comprised of arrows that present the causal links amid a system's components. Every causal link is allocated a polarity, which can be either positive (+) or negative (–) to show how the dependent variable alters once the independent variable alters. Positives are regenerative (or constructive) loops. On the other hand, negatives are degenerative or adverse loops. Conversely, a negative link specifies an opposite causal association. This means that when the cause rises the importance of the effect declines or vice versa (Eseryel, Ifenthaler, and Ge, 2013).

Influence diagrams are suitable for:

a) Enabling common knowledge of "*how things work*".
b) Enhancing communication amid specialists, decision makers and investors.
c) Bringing together knowledge from diverse areas in making a decision.
d) Inspiring well-organized thinking about cause-and-effect relations.
e) Being plain about uncertainty, more specifically, stressing the presence of rival suppositions and enabling learnt discussion about them.
f) Determining assessment criteria.
g) Determining modeling and data requirements specifically linked to the assessment criteria.
h) Constructing successive quantitative modeling (particularly once built with more formal instructions to define inter-related provisional prospects.
i) Authenticating the origin for and refining the transparency of skilled decisions (Hosseinian-Far and Jahankhani, 2015).

Moreover, an additional difficulty with cognitive maps as suggested by Eden (1992) is that, when the decision to be taken comprises risk, to solve the problem the decision maker should attempt to control the risk by getting more information, discovering added options, and waiting or furnishing a responsibility to participate in decision making to other people (Hosseinian-Far and Jahankhani, 2015). Working with influence diagrams then, that cater for all of the above and can clearly be modified and considered over time and change, may be a good solution to the problems arising of risk (Goodwin and Wright, 2005). As the authors of this work have already noted above, the unpredictability of the future is a serious limitation in working with the classical models of Cognitive Maps and Rich Pictures as expressed by Eden (2004) and Checkland (2001). The researchers have therefore chosen to work with the, - apparently, more adaptable to the uncertainly of the future, - influence diagrams.

METHODOLOGY

To decide which method had to be used in the analysis, the scholars took on a number of in-depth interviews with Customer Service managers and team leaders in Google's YouTube Customer Service department in India, which were followed by focus group meetings. In-depth interviews were selected since they allow the researcher to dig into problems than any other technique since they engage the interviewee in a long discussion through which insight is likely to be gained (Harding, 2013). At the same time, any expected bias from the side of the interviewer is anticipated to be lesser than any alternative interview

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technique (Alon, Baruch, and Nachmais, 2020, p.161). Accordingly, working in a focus group was chosen since such groups may come to more broadly accepted insights and decision choices if contrasted to decisions reached by sole participants (Manzano, 2022). Throughout the interviews the writers have recognized a number of explicit topics of concern, such as '*the availability and usage of existing resources'*, '*pricing and sales'*, '*miscommunication issues*' and '*any working areas inside the Google's YouTube Customer Service Dept that the interviewees thought to be strong or weak'*, but they did not follow any set instructions for the dialogue. The purpose was to allow the interviewees respond agreeably and spontaneously. The aim of the in-depth interviews and the succeeding focus group workshop, was to categorise any feeble or robust usage of resources in Google's YouTube in India and also to draw a comparison with what is the situation with similar operations abroad, and in what way resources might, as per the data collected by the contributors, improve communication, problem-solving, and decision making in the department which could win more customers and create a competitive advantage in the future. The insights of the in-depth interviews and the focus group meetings have assisted the writers to understand that a system is needed to improve communications which could lead to improved cooperation, better decisions, and increase of motivation. Such a system could well be presented in an influence diagram, as such tools have the capacity to connect ideas and concepts and to bring consensus which would then turn ideas into actions (Goodwin and Wright, 2005). Such improvements may well open the way for better communications, better decision, and increase in motivation which in turn might reduce turnover in Google's YouTube in India. The authors' recommendations, based on the study, are given in the end of this paper,

An influence diagram showing the present situation in Google's YouTube customer service department

The example that the authors of this work will use to test the validity and applicability of the influence diagrams in this study comes from problems with staff turnover and employee absenteeism in a Google's YouTube Customer Service Department in the South of India which however offers customer account services to You Tubers globally. These problems were identified of the in-depth interviews and the focus group meetings that took place earlier. As per the focus group observations, and the insights of the in-depth interviews, employee absenteeism and turnover have seemingly created a series of problems in the specific department over time. Management seems to have responded by applying stronger routinization and control over jobs to reduce turnover and absenteeism. However, given the fact of the unpredictability of the future and the risk and negative implications that the specific business may face from problem situations arising from employee turnover and absenteeism, the present researchers have applied the influence diagram technique in a group setting in order to collectively identify and reason the cause of the problems. Then working in a group setting the researchers attempted to show the effects over time in an effort to provide alternative solutions to face the issues under the given condition of the uncertainty of the future. The influence diagram in Figure 3 constructed for this problem situation identified nine possible loops and the associated linkages depicting the situation as described above.

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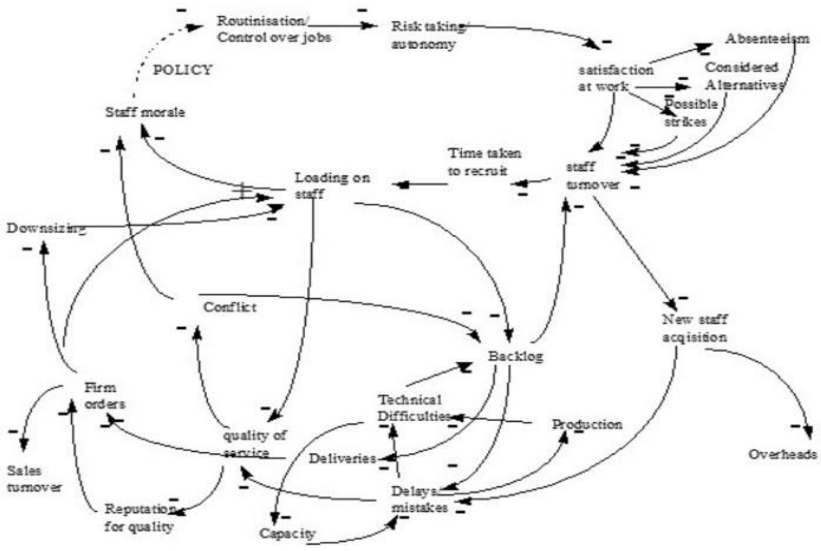

FIGURE 3
THE SITUATION AS DESCRIBED

The three more important variables around which the situation turns are (a) loading on staff, (b) backlog, and (c) staff turnover. It seems that top management's policy to enforce stronger routinization and control over jobs, as derived of the focus group insights, has affected negatively the problem situation. This because, as one can see in Figure 3 above, routinization and control over jobs are responsible for the first positive degenerative feedback loop. This is illustrated in the left top side of the diagram with the loop leading from downsizing to more loading, and to the reduction in autonomy and less risk taking by employees; which in its turn increases staff turnover and affects the other loops negatively. This degenerative collapse loop in fact links with backlog, as expressed by the participants of the focus group earlier, (as loops and variables are interdependent), and causes more delays and mistakes (the loop in the center) which have an impact on delivery and quality (delays and mistakes can be associated with delivery and quality problems) and more conflict between customers and staff, which in turn affect negatively morale. The third important loop is again a consequence of the other two main loops and is also degenerative. It is the loop in the bottom right side of the diagram. Greater staff turnover increases the need for new staff acquisition (and also escalates the associated overheads and creates a new degenerative feedback loop) and causes more mistakes, delays and difficulties, all of which flood backlog again. Here the researchers have extended the diagram by drawing a fourth loop which begins from technical difficulties and affects capacity and production negatively, and which again depicts degenerative collapse. As the reader can see, this is the loop at the bottom in Figure 3 which turns counter-clockwise starting from technical difficulties and leading to under-capacity, mistakes and delays, and production problems, as expressed previously in the in-depth interviews and in the focus group.

There could be two signals which may result from the above situation and these are portrayed by the delivery and quality loops occupying the central and left side of the diagram in Figure 3, going around backlog (as the authors said before delays and mistakes cause delivery and quality problems which affect the situation negatively and should be illustrated in the model by drawing the relative loops and linkages). Both these loops describe the bad quality and delivery service as a result of the backlog and signal a decrease in sales turnover, while of course they affect the loading on staff. In fact, the situation as it is described above

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does not give the scholar the chance to deal with the problem situation effectively at the present and degenerative collapse seems to prevail. Degenerative collapse can be further shown by drawing three other loops and the associated linkages which derive from the reduction in risk taking and autonomy and can lead to absenteeism, strikes, and the consideration of alternative employers, all of which encourage more staff turnover (the three loops in the top right side).

Finally, it is interesting to mark the transient dynamics which exist in the short-term decisions of the company management as it is presented to the reader. For example, the company decides to recruit new staff, as per the insights expressed in the focus group session, but the time taken to recruit the staff and train them increase loading to existing staff in the short run. On the other hand, more loading is unnecessary and out of hand as, as one can see above in the degenerative loops, it increases backlog which is the YouTube department's main operating problem (which as a consequence decreases morale in the short-term and causes more staff to leave bringing in more newcomers). Transient responses here also lead to recruitment of more inexperienced staff and of course additional backlog which the company, ironically, hoped to avoid. Transient dynamics have frequently presented a danger in delaying an anticipated outcome in problem situations (Smith, Holtzman and Matheson, 1993). The problem here might be that the company has not seemingly predicted the degree of uncertainty and inconstancy in the relationships among the variables affected by the management decisions, which as it seems is high in the short-run (although in the long-run uncertainty and inconstancy may reduce as the new staff is recruited and trained). As a result of all these slip-ups the company is driven to degenerative collapse. It is interesting to see these relations in the diagram in Figure 3. The positive (+) signs at the edge of the arrows indicate positive effects on variables while the negative (-) signs show the negative effects. As one can see, most of the signs in the diagram are negative which is the characteristic of degenerative collapse loops (Cabanas et all, 2017).

An influence diagram showing how Google's YouTube customer service can intervene to control the situation

As discussed above, after identifying the problems created of staff turnover and absenteeism and getting worse through management's decision to apply stronger routinization and control over jobs, the researchers assisted by participating staff in a workgroup setting during the focus group session, suggested some possible solutions over time and uncertainty to the problem situation. These solutions are depicted in Figure 4 below. Here the updated influence diagram introduces again nine loops and the associated linkages. Once more, the most important variables are (a) leading on staff, (b) backlog and (c) staff turnover, but several factors have changed. As one can see in the loop in the top even though downsizing has a causal relation with loading, the policy to give more autonomy to employees strengthens staff morale and encourages risk taking. The signal for pressure on morale and policy for autonomy have acted as a controlling mechanism to restore the falling morale. A morale feedback control loop has resulted from this intervention with a chain of positive consequences for the rest of the model.

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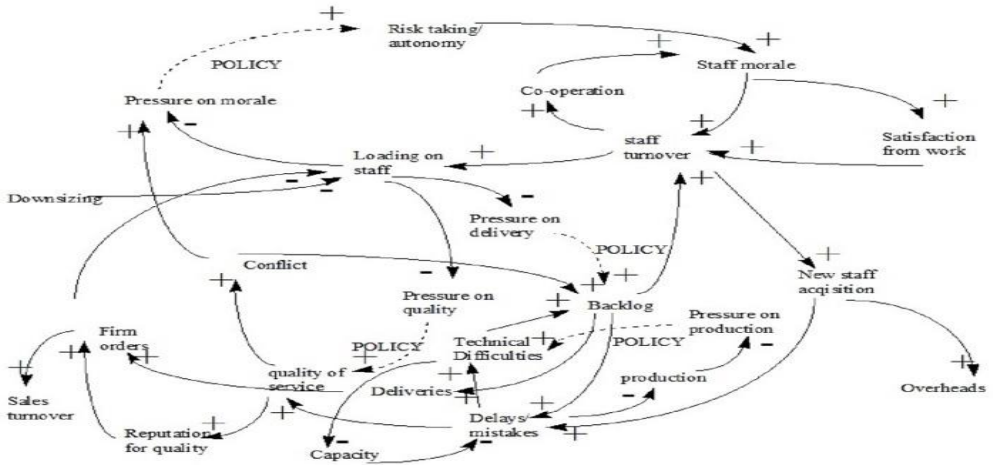

FIGURE 4
HOW YOUTUBE CUSTOMER SERVICE MAY INTERVENE TO CONTROL THE SITUATION

The first positive result can be seen immediately from the smaller loop at the top right side of the diagram in Figure 4, starting from staff morale, - as bringing more satisfaction from work reduces staff turnover and increases co-operation -, and as a further consequence strengthens morale more. In fact, the big morale feedback control loop in the top of the diagram links with the smaller positive regenerative feedback loop which forms a small "*virtuous cycle*"- which prolongs the regenerative growth of the specific Google's YouTube Customer Service department in the south of India.

But the benefits resulting from the previous decision can be seen more in the second main loop in the centre - the backlog regenerative feedback loop, - and the three other loops around this loop. Here the increase in staff morale previously has stopped staff turnover and has also reduced loading. This backlog regenerative feedback loop tells one that as loading on staff is controlled there are now less backlog and less delays/mistakes which in its turn improves quality and reduces conflict between staff and customers and finally again strengthens morale. The positive (+) signs characterize this loop and there is an interdependence between the variables - as already discussed in previous studies (see: Cabanas et all, 2017). What is interesting here is that improved quality (depicted in the loop at the bottom left side of the diagram) may bring more orders and as a consequence more sales. Of course, this is another positive regenerative feedback loop. Yet, on the other hand more orders increase loading on staff which in its turn causes pressure on quality (the loop in the left which leads from quality of service to reputation for quality, to firm orders, to loading, and then to pressure on quality, and which again ends at improved quality). The authors have intervened here with a policy for quality to control the situation - actually this is the second negative feedback control loop. The third control loop is the delivery-firm orders feedback loop in the centre and bottom of the diagram. Here reduced backlog improves deliveries which in return brings more orders but also increases loading (presented by the negative (-) sign in the diagram). Nevertheless, this apparently results in pressure for delivery and sets the situation under management's control. The pressure on delivery and the policy for less backlog are central in the model as they act as a controlling mechanism to condition backlog and maintain it low.

Further, as a consequence of reduced staff turnover fewer new staff is acquired, delays/mistakes and technical difficulties are reduced, backlog is again reduced and all this finally maintains staff turnover at low levels. It can be seen by the positive regenerative feedback loop at the right side of the model. The diagram is completed by the capacity-

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production feedback control loop which starts with reduction in technical difficulties and goes counter-clockwise. Here as capacity increases again and there may be some delays reflected in less production, there is a pressure on production. The policy to overcome technical difficulties secures the regular flow of production and keeps backlog low. What the authors have done in the diagram in Figure 4 with the contribution of the focus group participants, is to present the various causal and policy relationships diagrammatically. Finally, in the diagram reducing the number of new staff decreases overheads which can be seen at the right side of the model. To find a way to reduce costs, diminish backlog and to increase morale and autonomy have been this paper's goals from the beginning. In fact, applying the Influence Diagram technique in Action, all these loops have helped the writers to describe the improved situation from a systems' perspective and the associated linkages have enabled them to identify the causal and policy links among the variables.

CONCLUSION

As the reader has seen above, by applying the influence diagram technique in a group setting the authors have dealt positively with the problem situation which Google's YouTube Customer Service department in the South of India faced due to loading on staff and the decision to lessen employee autonomy. The technique has enabled the writers to work systemically under the assumption that "*the whole is greater than the sum of its parts"* with the problem situation by identifying the pressures on morale and all the other complications such as delivery, production, absenteeism, turnover, quality issues (the parts of the whole), and take corrective action suggested by the final Influence Diagram (the whole). The in-depth interviews and the focus group discussions have also facilitated the process since the problems were identified and suggested solutions were detected. To return to the influence diagrams methodology in the sense that is used in this study, both the initial and the final diagrams have assisted this paper to present the problem situation hurriedly and purely which of course is desired by management, as per discussions in the focus groups sessions, in order to take quick action and control any negative implications caused by '*unfortunate'* past decisions. For the most part, doing this exercise and drawing the influence diagrams for Google's YouTube Customer Service Department in South India, has enabled the company to understand the worth of the social systems method to resolve difficult problem situations in their organization. Bringing together all the variables in the influence diagrams has also helped management to improve decision making and recover relationships affected negatively prior to introducing the influence diagram for cognitive mapping technique. Also, the problems with causality over time and the risk rising of the unpredictability of the future are significantly reduced in the firm as the influence diagrams allowed to prepare for the future by suggesting certain actions, they did not try to forecast the future, as the future in this study is considered as totally unpredictable and even the best model can prove faulty in the event of sudden changes. This work therefore considers that working with Influence Diagrams for cognitive mapping in a focus group setting to re-construct and solve problem situations in businesses, is a valid and applicable method to deal with decision making in situations of causality over time and volatility in the online entertainment industry and may be used as a starting point to by future researchers to deal with similar situation in this industry and in other industries too.

DECLARATION

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