The effect of management decision processes on the management of bridges

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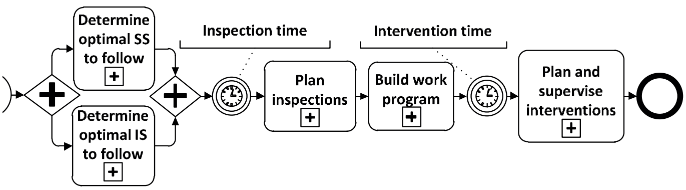
rder to ensure that bridges continue to provide an adequate level of service it is necessary to orm inspections and execute interventions. Since both inspections and interventions incur negat acts on bridge stakeholders, it is desirable to determine the optimal management strategy (OMS the optimal inspection and intervention strategies to minimize the negative impacts. An importa vever often overlooked, factor in determining OMSs, is how the processes used to determine the ct the net benefits associated with them, and thus the OMS. In this article it is shown that it is n sible to determine the OMS without explicitly taking management processes into consideration. s is done by showing how variations in the processes affect the MSs to follow, how the effect ca luated, and how the significance of the variations depends on the values of the incurred impacts.

words: optimal management strategy; inspection strategy; intervention strategy;

Management processes

main goal of the management in a bridge organization is to determine the optimal MS (OMS), ch consists of an inspection strategy (SS) and an intervention strategy (IS), to be followed that ures the bridges continue provide an adequate level of service while incurring the least total ative impact on the stakeholders. The principal processes that management in a typical bridge nization uses to achieve this goal are shown in Fig. 1. Although each one of these processes aff MS to follow only the process used to determine the optimal SS is discussed (Fig. 2). In various 's the process can affect the optimal MS because it can affect its comprised SS which is deemed mal. This happens if any of the activities included in the process are conducted inappropriately.



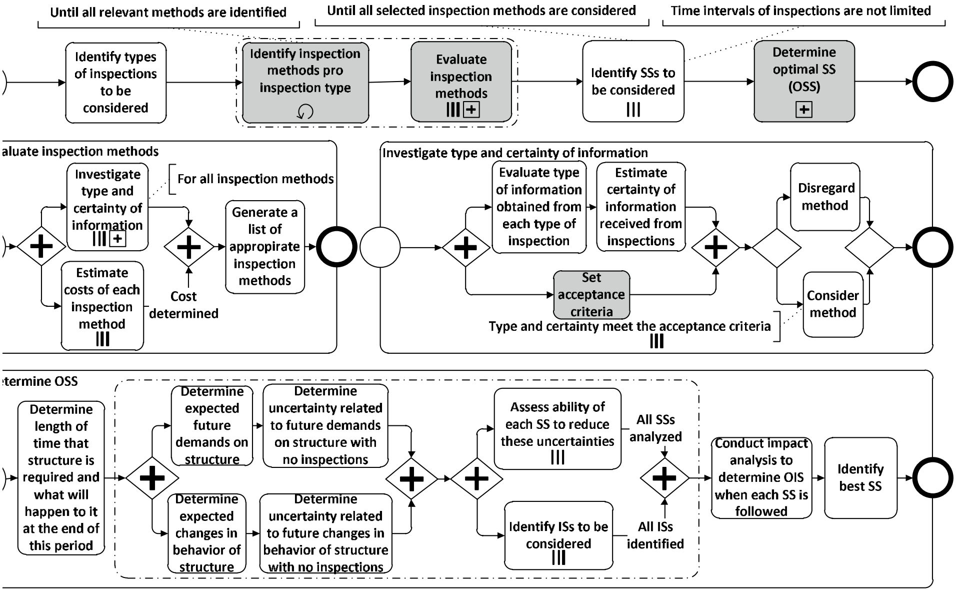
1: Management processes in a typical bridge organization

Example and results

rder to show how decision processes affect the optimality of MSs, how variations in these cesses can be evaluated, and how the values can affect the significance of these variations, an mple is conducted, where the process used to determine optimal SS for a reinforced concrete bri

https://doi.org/10.2749/222137813806521126

k (whose main deterioration process is corrosion of reinforcing bars accelerated by the use of de g salts), and variations in this process are used to identify 3 possible MSs. Then, the change ove e of the deck, the stakeholders, and their impact types are determined. Finally, the MSs are analy ıming various values of the impacts, and the OMSs are determined (Table 1). From the analysis be seen that the optimality of MSs depends on the variations in the process used by managemen ermine the optimal SS to follow, i.e. the process has an effect on the total negative impact of the s. Thus, without knowing the possible variations in this process, it is impossible to be sure whet ot the MS to be followed is optimal, i.e., a MS that is considered optimal for a process is not mal for another. More importantly it can be seen that it is possible to rigorously analyze a ıagement process, model its effect on the total impacts of MSs, and evaluate its effect on the mality of MSs.



2: Process 1: Determine optimal SS to follow

le 1: Expected impacts of MSs to follow

of act	M S	Owner		User		User/Public	Total
		C_{INS}	C_{INT}	$(C_U)_{INS}$	$(C_U)_{INT}$	C_{AC}	
	A	5.22	68.35	5.76	28.58	47.04	154.95
	B	3.08	69.52	4.34	28.03	48.01	152.97
	C	1.71	76.93	3.42	21.54	53.21	156.82
	A	5.22	68.35	28.81	142.88	47.04	292.30
	B	3.08	69.52	21.68	140.15	48.01	282.44
	C	1.71	76.93	17.12	107.7	53.21	256.68
	A	5.22	68.35	5.76	28.58	235.22	343.12
	B	3.08	69.52	4.34	28.03	240.03	344.99
	C	1.71	76.93	3.42	21.54	266.03	369.64
	A	5.22	87.38	5.76	28.58	47.04	173.98
	B	3.08	87.45	4.34	28.03	48.01	170.90
	C	1.71	76.93	3.42	21.54	53.21	156.82