

ACCESS DIFFERENCES OF DIAGNOSTIC SERVICES BETWEEN SMALL HOSPITALS AND THE SUPER HOSPITAL

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ABSTRACT

We face various problems to be solved when examining Hungarian health care. The intensifying of the burdens on health care workers, the continuous increase of the number of patients, the increase of the length of waiting time discernible for years now, the disorganization of the processes, the lack of financial assets and the growing number of migration among physicians can all lead to the collapse of the currently operating system. As a corollary to the current situation, the system is becoming more and more challenging to be operated; and the decision makers have a serious responsibility to properly optimize this field, which is strongly decisive for the economy as a whole.

The researches that the authors have conducted during the recent years suggest that one part of these problems can be solved by applying the management methodology which they have been knowing and applying for years now in various fields. The authors believe that the application of the methodology of Value Analysis can on the one hand help to discover, locate, characterize, typify and describe the problems; and on the other hand, the application of it might offer a solution in certain areas; because besides the fact that processes can be made more efficient, costs can be reduced as well to a certain extent, which pose the major challenges of health care at present.

Nevertheless, the question of the applicability of this methodology to the field of health care can rightfully arise; and as a corollary to that, we are looking for the answer to the question how and with what results we can apply a management methodology originating in the military industry to a field where processes are very complex, and the human factor is significant.

The authors have expanded various possible solutions leaning on the results of the analyses carried out in different fields of the health care system, which have raised further questions again and again due to the nature of the topic.

They have chosen the analyses of the fields of surgical procedures and diagnostics within health care for the examination of the applicability of the methodology within the frames of health care; which took place with the involvement of medical specialists due to the nature of the topic. The authors believe that later, taking into account the results of the research, the field of research can be expanded, and the results can be adapted to other areas of expertise.

Key words: Value Analysis, Value Engineering, health care, innovation, process improvement, diagnostics, surgical technique

VALUE ANALYSIS IN HEALTH CARE

We can state that Value Analysis is well-applicable in the fields of health care procedures, because introducing products to the market is time-consuming, the basic business activity can be characterized by a high investment need, surgical procedures are very complex, and most of them entail high costs; and in addition to those already mentioned, surgical interventions and diagnostic tools such as X-ray, CT, MRI, Ultrasound, EKG, Holter, etc.) are highly costly for the hospitals; and in relation to this context, payback is typically long-term and takes place in society. The professional staff able to use these diagnostic tools, evaluate medical evidence and give diagnoses, and health care staff as a whole entail high costs from the point of view of human resources and the operation and maintenance of these tools. Value Methodology provides an opportunity for presenting these processes with the help of a FAST (Function Analysis System Technique) diagram. (Bytheway, 2007), (SAVE International, 2007)

Processes can be analyzed, compared to each other and optimized; costs can be reduced. With the help of this methodology, processes can be made transparent step by step for the medical specialists of the differently-sized hospitals; thus, it will be possible to review and develop surgical procedures and diagnostics in teamwork; which would put forward a solution for part of the problems in case of the current lack of staff and funds; besides possibly resulting in long-term organization and cost savings. In the light of the above-written facts, the authors consider the research project very current which is supported by the strong possibility that associating Value Analysis and health care might give various innovation results due to their nature; which results can be decisive from the point of view of the possible future of the current processes taking place in health care. These factors appear to be everyday acute problems in the current health care situation, which are heavily expected to be solved.

Restaffing the current lack of health care professionals, making their assignments more efficient, shortening the waiting time and optimizing costs/expenses are expected to be solved urgently and as soon as possible. The sharp economic competition is encumbering the participants of the economy more and more, the impact of which is inevitably reflected in morbidity and mortality rates. More and more patients turn up in the system, while clinics and hospitals face a growing shortage of doctors. Due to the intensifying innovation, health care institutions are forced to procure the more modern diagnostic machines and tools; which oftentimes require unachievable financial resources. (Nádasdi, 2012)

In order to improve the indices, it is inevitable to enhance the performance of the health care system, which may demand new diagnostic methods, which have not been used so far in the field. The authors recommend the application of the methodology of Value Analysis and Value Engineering for describing and evaluating the processes taking place in the differently-sized hospitals, because based on our experience gained from the domestic and foreign usage of Value Analysis in practice, we can state that the Value Analysis projects explore the possibility of innovation results. The result of the Value Analysis projects which have not been applied yet can be the realignment of the workflow to make it more efficient; which on the one hand can result in great cost savings, and on the other hand it can entail the significant improvement of the standard of the activity. With the help of this, in the opinion of the authors the cost effectiveness of the work done in the smaller and larger institutions can be compared to each other.

Partly we look for the answers in the research, based on the data gained from the analyses, to the questions with what result we can effectively divide healing and therapy between smaller hospitals and large hospitals and how this can serve the process of medical attendance.

In case of the already existing surgical procedures, authors conceive the revision and the step-by-step analysis by applying Value Methodology of the surgical procedures, the applied devices and tools and the employed companies (e.g. sterilizing agents, instruments) to be expedient; with the help of which certain steps and a series of moves could be transformed, massed and eliminated. With regard to the still evolving solutions, it is advisable to apply Value Engineering. Traditional doctor-research groups could be complemented with engineers, IT specialists, and the experts of the so-called "soft sciences". (Nádasdi - Körmendi, 1996)

We believe that it is expedient to involve this management methodology in case of the techniques used in health care. Not only in case of the already existing surgical and research and development

procedures is it worth considering applying Value Engineering, but in case of the new diagnostic technologies/procedures currently under evolving. The methodology optimizes the processes under planning, surgical solutions and diagnostic tools and devices already in the planning phase. We opine that contrary to the current high expenses and the significant shortage of physicians, these processes could be optimized, and the results we would gain from this could propose a solution to some of the problems. Certainly, we have to mention the factors which hinder the implementation of the methodology within the frames of the health care system. (Nádasdi, F.-Vámosi, K., 2016)

The fact that certain surgical and diagnostic steps cannot be eliminated in spite of economic considerations and aspects, cannot be passed by during the analysis. Besides that, we must take into account the capacity of the health care staff in the system and we have to emphasize that the work is performed on persons as well.

THE DIFFICULTIES AND OBSTACLES OF THE PROCESSES OF MEDICAL ATTENDANCE IN HEALTH CARE

Innovation is of crucial importance in health care processes. The search for new diagnostic technologies and surgical solutions is becoming more and more decisive in health care. Currently, Hungarian medical attendance is regionally fragmented and disproportionately expensive. Patients do not have access everywhere to the most modern, highly costly treatments. On the one hand, the smaller attendance units do not have CT, MRI diagnostic tools, and there is no specialist continuously present who could set up the diagnosis for the lower level, locally available e.g. X-ray diagnostics. There are some fundamental characteristics of the processes taking place in the field, namely high investment need and limited possibilities.

The profit of the payback of the investments often appears in society, and in the economy nationwide which is not reflected in the efficiency of the health care processes and it does not directly serve cost-efficiency.

No source returns directly from the central budget, it does not directly serve health care investments, and it does not directly ameliorate its options and facilities. The fragmentation of the health care activity in many places entails a disproportionately large amount of additional costs; because the conditions of every single element of the workflow and of the interventions must be separately created in small units.

The medical specialists can only do patient care in limited time because of the personal conditions; because during most of the day there is only duty service; consequently, the utilization of the machines and medical activity are not economical. Besides all that, in case of the current processes, physicians do not have the option to use the most modern diagnostic procedures with the most modern methods. Due to the current operation of the system, the demand for medical attendance and patient care cannot be fully satisfied, there are long waiting lists for patient care, which fact negatively affects the health condition of the population and the operation of the economy as well.

Based on the above-described factors, the examination and optimization of the workflow taking place in health care are more and more justified. The authors look for possible solutions to the issues revealed in this field, in this, introducing a new method, not yet used here, can be helpful. There is not only a difference in size between the two kinds of hospitals, but there can be a significant difference in quality; in case of creating the proper operational environment.

First, we present the operational possibilities of the operating rooms and diagnostic tools in these two kinds of hospitals. We have summarized the particularities of the surgical and diagnostic procedures practiced in the small hospitals and the super hospitals in the following.

DIAGNOSTIC CONDITIONS IN SMALL HOSPITALS

The medical work-up in smaller hospitals takes place in an ambulatory manner; patients are guided to many places on site of the hospital (e.g. gynecological patients are first sent to the first-floor lab, then to electrocardiogram on the third floor, and then, if further examinations are deemed to be necessary, the patient is sent to further different examination places on site of the hospital.)

The expensive and good-quality machines needed for performing surgery such as anesthetic machines, operating tables, manual machines and other equipment cannot be procured because of the modest budget of the small hospital. As a corollary to this, in case of the tools and machines applied in smaller hospitals, breakdowns occur more often, new equipment must be procured within a shorter span of time; these facts result in the prolongation of waiting lists and in the long run, they cost more. Even if the basic diagnostic tools are at hand in these health care institutions, such as X-ray machines, laboratory testing instruments, etc., the personal conditions needed for giving diagnoses and medical reports and records are continually missing. Due to this, at many places, medical reporting is carried out online, during which the reporting specialist is not in direct contact with neither the patient, nor the medical specialist asking for the examination; thus, the diagnosis is set up without a medical consultation. Diagram 1 shows the diagnostic and surgical functions of the small hospital.

DIAGNOSTIC CONDITIONS IN THE SUPER HOSPITAL

The centralization of the surgical examinations is necessary and possible from the point of view of the patients and the system; all the necessary examinations of patients facing a surgery can be carried out in one unit. Preanesthetic assessment can be carried out in a separate unit before the surgery, with an anesthetist who is assigned only here, but in a rotating system in order to parry one-sided professional activity.

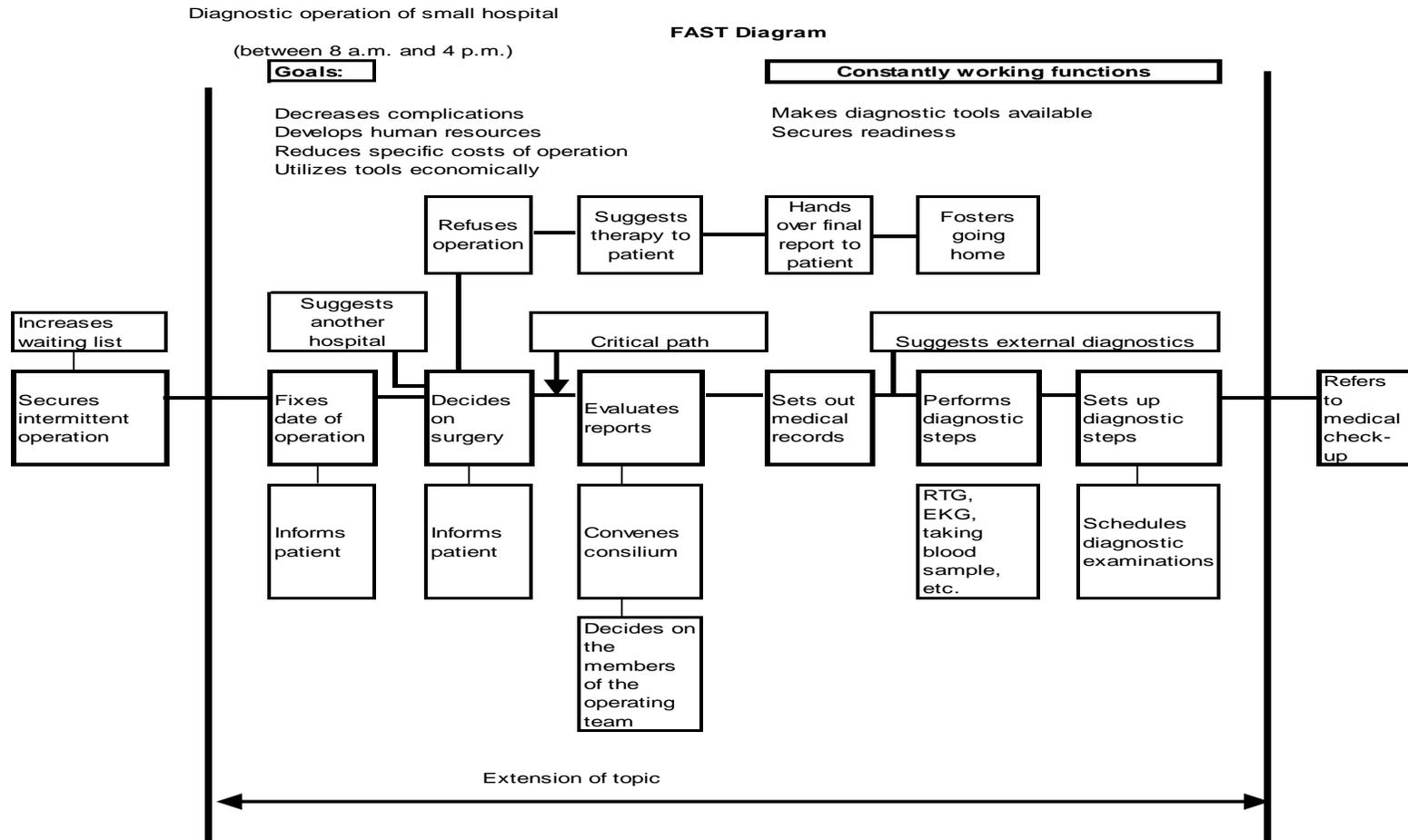
In case the patient needs treatment or preparation because of the surgical load, it can take place in the department specially designed for that purpose. In such hospitals, the most expensive, best, highest quality, most trustworthy and most modern diagnostical tools and equipment can be procured due to the higher budget, unlike in case of small hospitals and their potentials.

In parallel with that, besides the higher budget, a higher number of physicians and professional staff can be employed. The surgical block can even consist of numerous operating rooms operated simultaneously and designed to be next to each other, and these rooms could be operable 24/7 with the proper organization.

Based on the above-mentioned example, instead of four, twelve surgeries could be executed in an operating room per day; thus, the utilization of the equipment would be triple. It is possible to design even more than one of the so-called septic operation theatres in super hospitals, where, if conditions are met, inflammatory cases could be, although less frequently, but continuously operated due to the intensified disinfection. Besides the operating theatres, there could work a state-of-the-art, high capacity intensive care unit as well. A department can be designed which is equipped with monitors and other machines and attended by a sufficient number of specially trained professional staff for every single operated patient in need for those.

The highest standard diagnostic tools are constantly available in these hospitals (CT, MRI, spect CT, life-supporting intensive therapeutic machines). A sufficient number of human resources in a continuous work schedule with the proper professional knowledge for using the highest standard diagnostic tools and with the knowledge of surgical techniques is available. (Vámosi, K. – Nádasi, F. – Totth, G. 2016)

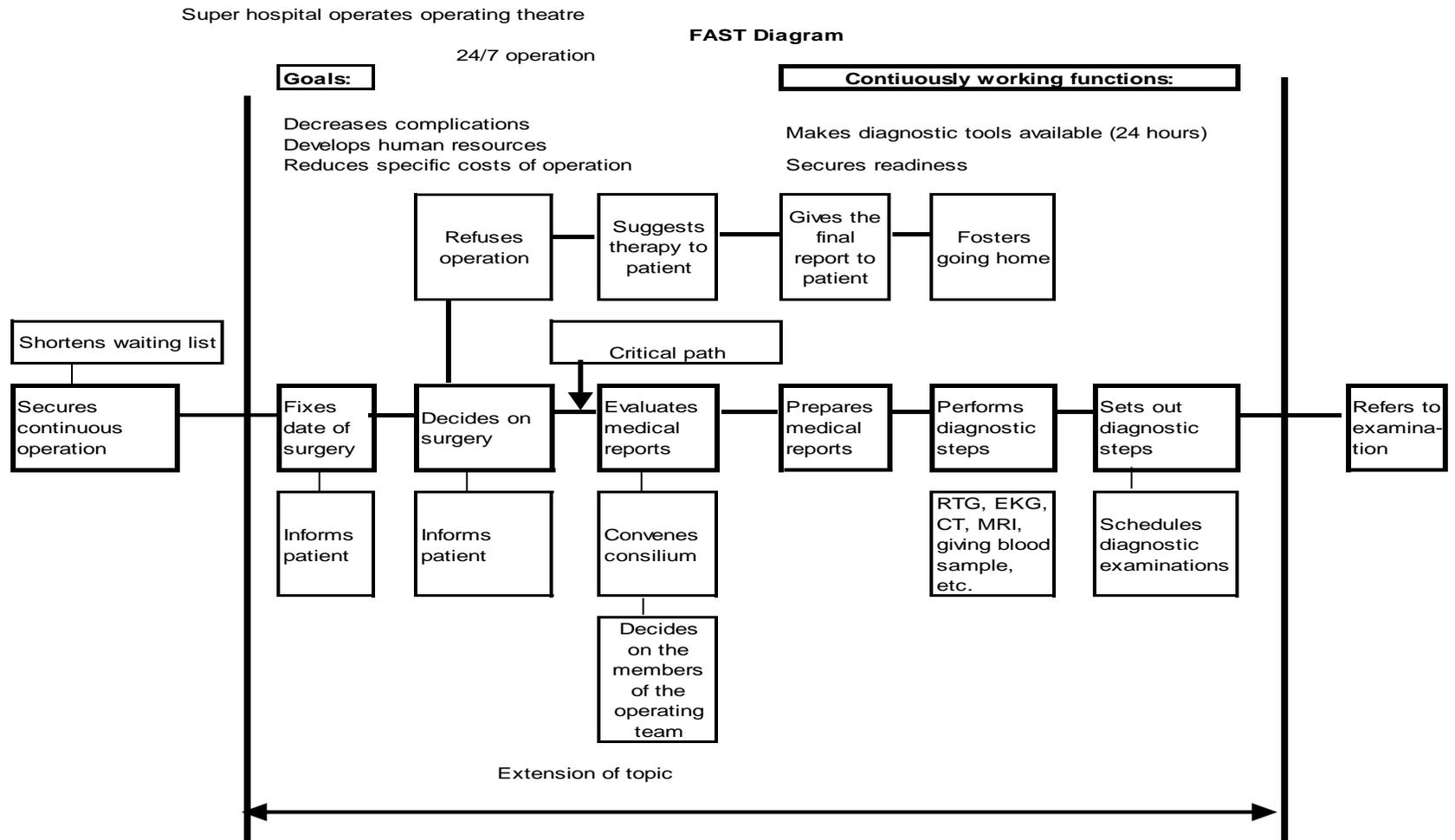
Diagram 1.: Diagnostic and surgical procedures in a small hospital
(between 8 a.m. and 4 p.m.)



Source: own edition

Diagram 2.: Diagnostic and surgical procedures in the super hospital

(24/7 operation)



Source: own edition

Analysis of the results

It is a characteristic of Hungary that only the population of Budapest is as large as 2 million people. There are some cities of 200-300 thousand people (Debrecen, Szeged, Miskolc, etc.). The super hospital can basically satisfy the majority of the demands, which can be seen from the fact that the Hungarian government has decided to bring a super hospital to life in the Hungarian capital, Budapest. However, we can state that the smaller cities need their own hospitals as well. As we can see in Diagram 1, these can only satisfy the diagnostic demands in part; therefore, certain demands (e.g. CT, MRI, etc.) must be satisfied in the large hospital. We see two conflicting interests; the non-Budapest population is interested in not having to travel long distances, at the same time, small hospitals can only satisfy the diagnostic demands in part; moreover, they are unable to perform certain surgeries because of a lack of equipment and a lack of experts.

At present, there are debates over the construction of a super hospital in the capital, Budapest because of the conflicting interests and the large investment need. As the result of our analyses, we can state that it is expedient to support the building of a super hospital in Budapest, while in the non-Budapest areas, in the bigger cities, it is advisable to create more diagnostic options than the currently available ones. In the opinion of the authors, the application of Value Analysis could make the processes more transparent for the decision-makers; thus, it would foster making the right decision. We believe, due to the result of the work done and the probable future payback, that there is a *raison d'être* for building a super hospital in the capital.

Summary

We have analyzed the process of medical attendance in our research in the differently sized hospitals by involving medical experts and specialists. Based on these, it has been proven certain that the course of proceedings currently taking place in health care need to be reformed and it is expedient to involve new methods, not used so far and to create a medical service system.

Based on the disclosed problems and the gained pieces of information, we have modelled the surgical activity taking place in the small and large hospitals with the help of the methodology of Value Analysis (FAST diagrams). According to our estimates, the costs of patient care can be lower in a super hospital compared to the costs in smaller hospitals.

The steps that can be seen in the diagrams contain the functions created based on the demands of the patients and the medical specialists, based on which the health care interventions can be compared to each other; interventions which are performed with the same indication, but under different circumstances and performed during different procedures. With the help of the flow diagrams, we can present and portray the different steps, risks and the related costs as well now in an exact manner, which emerge in the examined health care workflows.

It is necessary to perform separate examinations in the following to evaluate and assess cost-efficiency; so that not only does it have to be comprehensible for physicians, but for the economic experts doing the assessment of sources as well.

In contrast, with the help of the FAST diagrams applied in Value Methodology, it is possible to make these workflow phases transparent and comprehensible on the one hand for the physician groups, and on the other hand for the decision-makers; and thus, their cost implications as well, because this methodology analyzes the functions and the costs at the same time. From the diagrams presented during the analysis, it is obvious that there are significant differences between the diagnostic tests and surgical procedures. In case of the traditional technologies carried out under more modest circumstances in smaller hospitals, we can expect longer recovery and convalescence time, possibly more complications and a higher level of specific cost. In contrast to that, by applying the modern, but more expensive technology, the load of the patient is smaller, recovery time and absence from work are shorter. Medical attendance of patients, material supply, the security of instrumentation and of the amount of medical equipment in super hospitals are of a much higher level, and due to the high capacity, the attendance of foreign patients becomes possible, thus, the payback of invested sources can be accelerated.

Higher revenue makes the pay raise of the workers possible; thus, the migration of health care professionals can be reduced. After the research has been done, the authors believe that the idea of the centralization of patient care has been corroborated. During the centralization process, the

utilization of Value Analysis is recommendable in the healing activity as well. Besides the centralized medical care, we consider the acquaintance of the health care professionals who participate in the medical attendance with the method of Value Analysis to be very important, thus, they can apply it during the supervision of workflow and possible reorganization of it; which could provide a solution to the existing problems.

Based on the experience in the US, the method of Value Analysis can be applied in all fields of the economy with success, thus, in the field of health care as well. In our opinion, it is possible to provide a more economical and higher-level health service in the centers with the help of the procedures and applied treatments designed accordingly.

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