Collaboration between TVET Institutions and Industries in Bangladesh to Enhance Employability Skills

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***Abstract*—Adequate collaboration between technical and vocational education and training (TVET) institutions and industries would lead to provision of relevant practical skills for industrialization. This article aimed at establishing the extent of collaboration between TVET and industry to enhance employability skills. The research objectives were to identify the online-means of industry-institution collaborations, to suggest how to link TVET institutions with industries, to propose collaboration initiatives, and to identify the common problems faced during collaboration. In Bangladesh, the gap is widening between knowledge generated through training systems of TVE, and the skills demanded by employers. Thus, the article recommends that the industry should provide contemporary skills by training and establish networks with TVET institutions for minimizing the gaps. The author of the article consider that collaboration, the important means cab be made the highway to bridge the gap and to enhance employability skills of TVET people in Bangladesh.**

***Index Terms*—Collaboration, TVET Institutions, Industries in Bangladesh, Employability Skills**

I. INTRODUCTION

Collaboration with the industries and the education institutions are the major rising concern in many developing countries like Bangladesh. International recommendations of the United Nations Educational, Scientific and Cultural Organization for the improvement of technical education and vocational training systems systematically referred to the need to forge closer links between training and the labor market. It was found out that industrial attachment was the most pronounced linkage; lack of initiative by TVET institutions and poor response from the industries were among the major challenges facing the collaboration of TVET and industry [5].

The collaboration between the rate of technical progress and the quality of human intervention has become increasingly evident as has the need for those active in the economy to be trained to use the new technologies to innovate. New skills are needed and educational institutions are required to meet the need by providing not only the minimum of schooling or vocational training, but also training for scientists, innovators and high level specialists [8].

According to World Bank [9], the reputation of TVE institutions is dependent on their ability to produce qualified young people who will be immediately operational in the work place. The outputs of the TVET institutions are the input of the industries (shown in the figure-1). According to the Republic of Kenya [7], technical institutions should have closed linkages with the world of work to solicit support of industry in the enhancement of practical training through such activities as donations of equipment and tools, staff exchange programs and placement of students and staff on work experience attachment.

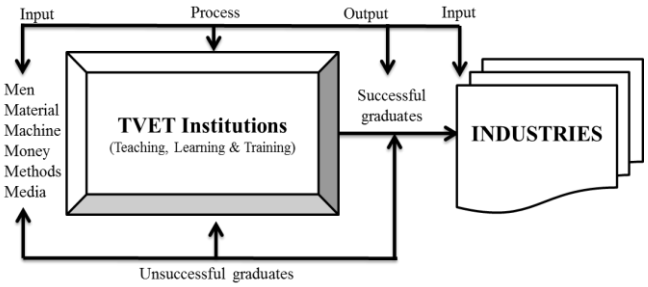

Figure: 1 Outputs of TVET are the Inputs of Industries

Sometime, TVET uses curriculum created by academics with little or no understanding of industry requirements or local needs. The adoption of market responsive TVET is still an on-going process in Bangladesh and a very new experience in emerging economies or those moving away from a centralized, command and control dominated recent history. In most emerging economies, educators and industry operate in different worlds and often have little contact with each other. Frequently their social networks and association linkages have no overlap. Surveys [4] often show a complete lack of understanding or respect for the interests and commitments of the other group. The information and communication technologies (ICTs) are expanding tremendously. Proper attitude and psychological set up such as motivation required to integrate new technologies in TVET. The collaboration indicates the relations between theories and practical things which is required for the job. The collaboration increase the knowledge as well as the skill of the TVET people. Finally, it enhance the employability skills. The dimensions of competency in relation to Employability Skills [9] or Employability Skills for the future identified eight Employability Skills [1]: Learning, Technology, Communication, Teamwork, Problem Solving, Initiative and Enterprise, Planning & Organizing, and Self-Management.

II. COLLABORATION BETWEEN TVET INSTITUTIONS AND INDUSTRIES

The next parts of the article identify the online-means of industry-institution collaborations, suggest how to link TVET institutions with industries, propose some collaboration

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initiatives, and identify the common problems faced during collaboration. The article end with discussion, implementation issue, and recommendation that the industry should establish networks with TVET institutions for minimizing the problems of skill gaps and finally to enhance employability of TVET people in Bangladesh.

Means of industry-institution collaborations: TVET institutions could bridge the gap with industries by updated technologies (in figure-2). The *Skype* is used broadly for video conferencing; the *U-tube* is widely used to share the video; *Pinterest* is a kind of storage house where the information, class lectures, reports, web links etc. can be stored to be shared; *Facebook* is one of the most popular social networking means where constant interactions and collaborations take places; time sharing sites called *Timebank* where reciprocation of knowledge and experiences can be done effectively, for example one student has the technical knowledge about Piano and another student can sing the song. Both of them can share their activities for mutual help after making the collaborative network with *Timebank*. Different types of educational Blogs can be created to share the educational information using the *Blogger*. These are the modern means of industry-institution collaboration. These means of collaboration are recently absent in TVET in Bangladesh. However, they can be integrated in TVET to make collaboration.

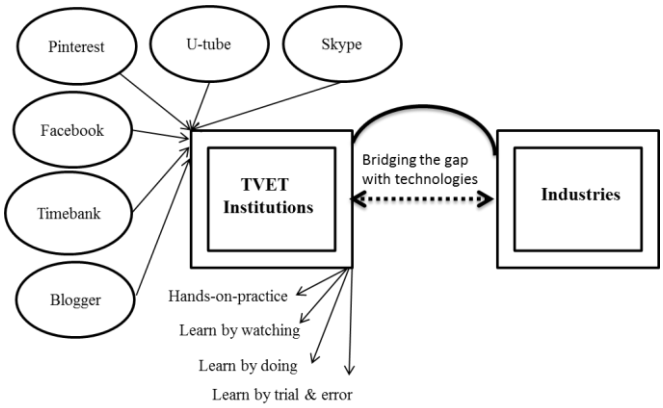

Figure-2 Means of industry-institution collaborations

The TVET curriculum should consider those means of collaboration. If the TVET students get the opportunity of communication with web-based mechanism, they can interact with the industries to connect the knowledge with the practical things. Finally, the skills can be improved by watching, by doing and by trial and error rather direct hands-on-practice.

Key reasons why TVET needs to strengthen links with industries: The TVET institutions are needed to strengthen links with industries to improve networking between academia and industries to create a better understanding of each other's needs and to identify how they can be met through the industry programs. The domestic industries should have link with the industries abroad to enhance indigenous standard. The TVET institutions will have the link with their home industries to determine their standard and to develop their own curriculum. With apprenticeship, the students with technical know-how will be able to get job in the industries. The enhancement of employability & economic stability will be ultimate ambition in this regard. In most emerging economies, educators and industry operate in different worlds and often have little contact with each other. Frequently their social networks and association linkages have no overlap. Surveys often show a complete lack of understanding or respect for the interests and commitments of the other group. In countries with a tradition of central planning, a market place that creates demand for training is unknown. The practice has been for Government to provide free training in skills determined by government, independent of employer demand. The system uses curriculum created by academics with little or no understanding of industry requirements or local needs. The adoption of market responsive TVET is still an on-going process in developed countries and a very new experience in emerging economies or those moving away from a centralized, command and control dominated recent history. In these circumstances, Educators have no experience in marketing or of tailoring services to a 'customers' needs. They often they see a market orientation as cheapening the values of education and giving up a sense of social responsibility in the pursuit of revenue. They have no tradition of market responsiveness and a very real fear of becoming salesmen. They are also afraid of the unknown as their orientation; experience and education have in no way prepared them for this new orientation in TVET.

Consumer-driven approach: Industry is the primary consumer of TVET graduates. Industry participation in TVET curriculum and workplace training opportunities is the primary way of achieving this. If employers are not involved in the process of the specific skills attitude and behaviors required by graduates, they are less likely to see any relevance between TVET and their skills needs.

Effectiveness: Very few countries can afford to provide a comprehensive and effective TVET system purely through Government financing. In many developed countries, it is estimated that up to 80% of skills development is provided by industry for its own workers [4]. Beyond this, in countries with reasonable links between industry and TVET institutions, 20% to 40% of TVET institutional revenue is generated by the 'entrepreneurial' activities of the individual institutions. This is often seen as a part of beneficiary based financing of TVET. It assumes that all parties benefit to some degree and hence can support TVET to the corresponding. If Industry sees no benefit in the linkage, they will not support such a program and legislation will be largely ineffective.

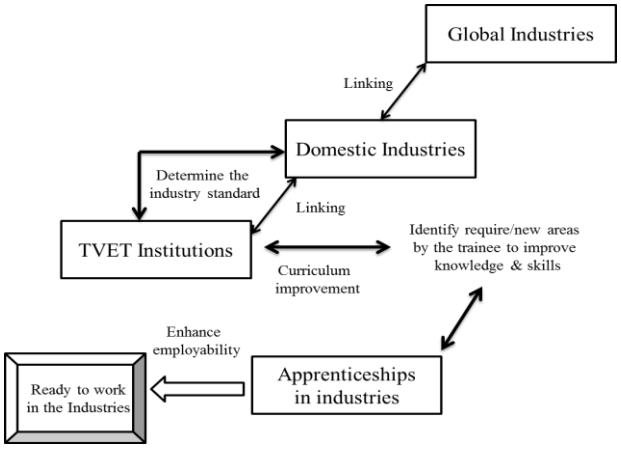

Figure-3 Linking TVET with industries

Curriculum upgrading: In academic education, curriculum is relatively stable. In TVET, a 3 year old curriculum may be teaching the history of technology and not the skills currently required by industry. Constant feedback from industry is the primary input to updating curriculum along with graduate input on the relevance of their institution learned skills to performance requirement. Industry-institution collaboration will have ensured the effective correspondence between the engineers in the industries and the teachers in the institutions. Consequently, the methodologies of teaching-learning can be improved and updated as the teachers are the creator of those methods and techniques of teaching.

The collaboration initiatives: Collaboration initiatives (shown in figure-4) may be taken on by TVET institutions for various reasons. Of the most emphasized collaboration objectives feature; the improvement of research capacities and commercialization potentials, the improvement of technical skills, to reduce demand and supply mismatch, to enhancing of employability skills, and the promotion of knowledge transfer between institutions and the community. The following collaboration initiatives of TVET-industries may consider to enhancing employability skills in Bangladesh.

The Industry-institution collaboration program can *bridge the technological gap*. The appropriate knowledge and skill require to handling the modern technologies all around the world. The modern industries are equipped with sophisticated technologies those are mostly most of the time unfamiliar by the TVET students in Bangladesh. To set up the collaboration criteria is essential for the country.

Industry Ph.D. program may invite professionals from industry to take on industry-based research to promote innovations leading to increase competitiveness. Thus, a memorandum of understanding can be signed between the participating industry and the university to confirm both parties' commitment in the collaboration. Each Ph.D. candidate can be supervised by at least two supervisors, one from the industry where the candidate works and one from the University at which the candidate is registered. The associated industry may take responsibility for identifying the industry supervisor and the University for issuing the appointment letter. Research topics will be suggested by the industry concerned for the research to be carried out must be in their business area. The industry supervisor will oversee the research as it carries out in industry. The University supervisor has to meet the Ph.D. candidate for supervision at the workplace as well as in the University as agreed in a schedule acceptable to both industry and University. The industry will be responsible for providing research materials and equipment for the candidate. Assessment of research progress is the responsibility of both supervisors in ensuring the research work undertaken is meeting the needs of the industry and satisfying the requirements of the associated doctoral degree. In other words, the University will responsible for ensuring the quality of the candidate's research meets the doctoral requirements while the industry is responsible for ensuring their own industry needs are met.

Internship program in the Industry is collaboration between institutions of higher learning and industries which permits students to be attached to industries. This training program is part of the pre-employment skills development process [10]. To support the industrial training programs, a large industry is a necessity. The success in supporting learning experience of these collaborations depends highly on suitable matches between the students' field of studies and the industry field. Students tend to prefer living near their home during the industrial attachment period to reduce living costs but suitable industries may not be available at these locations. Some industries are reluctant to give challenging work to trainees resulting in students being 'undertrained' technically and socially. Institutions too are facing a challenge in finding suitable industries. In general the programs have been rather successful as the numbers of students securing work after graduations as a result of their trainings are quite high. Students returning to universities or polytechnics after the industrial trainings often feel more confident in their ability to learn and undertake vocational-related tasks.

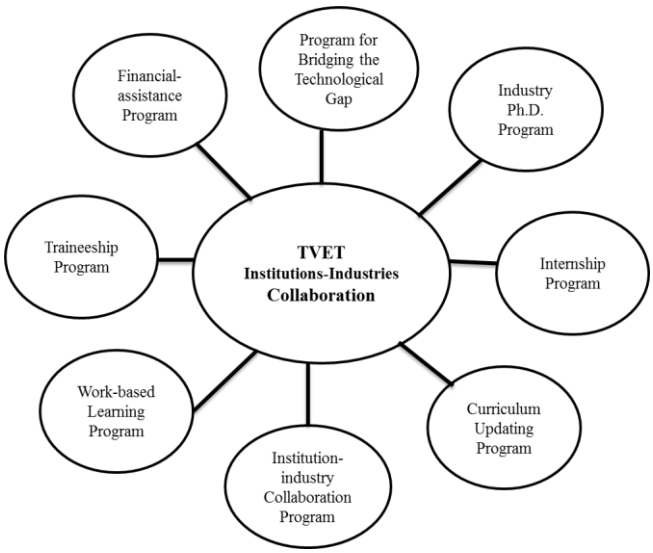

Figure-4 TVET institutions & industries collaboration

As a developing country, the gap between theoretical and practical things are increasing, collaboration initiatives will play an effective role as highway as means of this, learning in the institutions be enhanced by the *program of updating curriculum.* Today's new technology will be old tomorrow. Appropriate knowhow on the new innovations are required to cope up with the demand of the job markets.

Institution-industry collaborations are expected to enhance research capabilities on both sides, improve productivity and increase commercialization potentials of products generated from the research projects. To promote institution-industry collaboration, organizational support should be provided via centre for research and centre for university-industry relations. As a consequence, many memorandums of understanding have been signed between institutions and industry as an indicator of willingness to collaborate although an equal number of activities have not actually materialized. Optimizing research capabilities is one of the goals of collaborations in the higher education sector. Thus, the collaborators here are mainly institutions of higher learning with some participation from research institutions and industries. In the institution-institution collaboration, sharing of resources such as research equipment and expertise are

prevalent. A typical collaboration is a research project undertaken by technical experts of two or three universities. Recently, industry participation has been encouraged in any research projects undertaken by universities in Bangladesh.

The main aim of the *work-based learning (WBL) program* will be to enhance employability potential of graduates by promoting their soft skills, technical and vocational skills. The WBL curriculum will co-developed by the TVET institutes and related industries. Some study raveled that some benefits such as improved facilities through industry donations and teachers' knowledge and skills improvement can be possible by WBL program. Despite its potential benefits, the WBL faces several hurdles in terms of students' logistics [2].

Traineeship programs will be representing institution-industry collaboration to introduce into the TVET system. The programs will involve upper Polytechnic students to work in industry two days a week as part of their pre-skills development process. These traineeship programs will be only offered to students in the skills stream. The aim of the traineeship will be to provide job training for the TVET students. As well as providing workshop facilities, training materials and products. Some companies are adopting the TVET institutions as a centre of excellence for training its workers [1]. Some industries are reluctant to accept students that have yet to become skilled. Thus, to invite better participation from industries, the government has to kindly improve the human resource development fund given to participating industries in which industry can claim up to 100% of training related expenditure [3].

Some knowledge of *financial assistance program (FAP)* is vital to ensure students to manage their financial needs when they secure employment. To prepare students for real working life, it is imperative they are exposed to financial management issues. FAP can be collaborating with the employee provident fund to raise awareness among TVET students of the employees' and employers' rights and responsibilities.

The problems of collaboration: It was believed that the role of education and training should be focused on enhancing labor productivity; therefore, a well-developed TVET system was considered as a necessary condition for successful economic development. The industry lacks interest (shown in figure-5) in *investing money* in linkages with TVET.

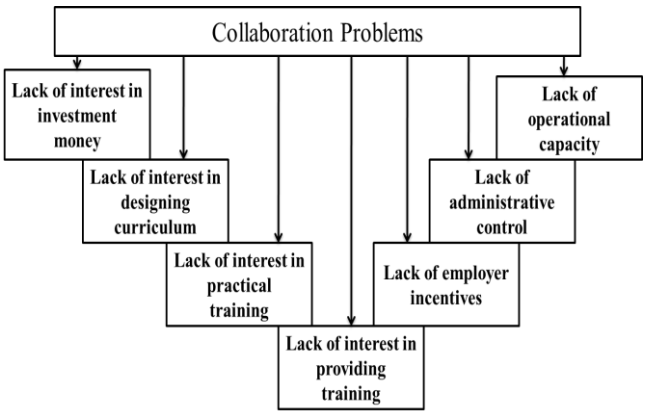

Figure-5 Problems faced during collaboration

To implement a successful linkage, both TVET providers and the industry should feel that they have mutual benefits; more importantly, the industry should feel that linking with TVET delivery will lead them to significant benefits and/or economic profits. However, in Bangladesh's case, enterprises have not seen these benefits and do not feel encouraged to solidify industry linkages with TVET. The industry isn't involved in *designing curricula* and evaluations of skills. Survey, which states that the few firms are involved in curriculum development for training and educational institutions; even fewer are involved in the testing of students. The provision of *practical training* in the work place is also rare. The enterprises are not highly interested in providing training for trainers. However, it is important to provide them with workplace training in order to update trainers' knowledge and skills and this can only be accomplished through a well-established partnership with enterprises.

Provider's lack of operational capacity prevents it from building successful networks with enterprises. In Bangladesh, many local institutions don't have the ability to develop and operate their networks with their counterpart's enterprises. Only collaboration without effective operational capacity does not make any sense. In Bangladesh, lack of operational capacity in the industries is another problem faced in collaboration.

To make a collaboration is easy however it may difficult to *control by administrator*. The administrator should have special interest in the objectives of collaboration. The administrators of both institutions might have special control unit to ensure the smooth program in both of the places. One of the factors contributing to the limitation of industry participation is lack of direct administrative control. This loss of administrative control made enterprises less interested in TVET participation.

Lack of employer incentives has also discouraged industry participation. The government has not provided sufficient financial incentives and reward programs to encourage enterprises to partner with TVET. The lack of employer incentives are also not adequate and as a result they become demotivate to provide training. The capacity of institutions are increasing as a result the operational capacity in the industries also be there.

III. CONCLUSIONS

Recommendations: The TVET institutions should develop linkages between industrial production and education and serve the needs of local economic development. The law required TVET institutions to build networks with the industry by providing legal principles for the operation and development of such linkages. The government of Bangladesh should formulate the policies on TVET industry linkages, provided the basis for the policy framework for TVET industry collaboration, i.e. collaboration types, collaboration building methods, and specific roles of providers and enterprises. Based on the type of collaboration, TVET institutions could provide practical training for their trainees. To evaluate TVET industry linkages, in particular, manufacturing industries should establish consensus which will provide skills required by specific occupations.

To overcome the bottleneck of formalizing collaboration of TVET in Bangladesh, the government should establish regulations for the linkages. This article recommend (1) to forecast and report on industry skill shortages and the supply of and demand for human resources; (2) to establish industry

training plans including the grading of skills for specific occupations; (3) to participate in the development of curriculum and course materials and for teacher training; (4) to monitor the delivery of TVET; (5) to make arrangements for staff training and vocational skill assessments; (6) to establish and run vocational schools or vocational training institutions independently or in partnership with others; (7) to supervise the recruitment of students and workers, particularly in areas of specific skill shortage or those in need; (8) to establish a skill assessment body for their industry; (9) to provide support and resources for the delivery of training; and (10) to disseminate TVET policy information to their industry sectors.

Finally, Government should encourage, support, and promote institution-industry collaboration and establish a system guided by the government and coordinated by industry associations; TVET institutions should take initiative and collaborate with business and industry in the field of student internships, curriculum development, admissions and employment, instructor training, employee training, and their continuing education; TVET instructors should receive at least two months of industry training every two years; Business and industry should accept students and instructors with paid internships and industry training; TVET institutions should provide vocational ethics and safety education, provide an accidental injury insurance for student interns, and assign instructors to supervise student internships.

The TVET curriculum should also feature new teaching techniques that combined both theory and practical training. It is required to establish of an institutional framework to collaboration to enhance employability. It is also required to establish of hands-on training centers in TVET to promote collaboration. Finally, to determine the various models of collaboration. The model may 'mutual cooperation between enterprise and TVET institutions' that is based upon the belief that collaboration brings mutual benefits to both sides. From the enterprise's side, the benefits are the improvement of industrial production processes and productivity. From the provider's side, the benefits are accessing enterprises' equipment/expertise as well as gaining direct financial support from those same enterprises. In this model, enterprises move forward to develop collaboration by selecting the provider that appears to be the most competent in providing relevant specialized training to their respective companies.

Implementation issues: The collaboration can be formed in five main areas: (1) development of curriculum and learning materials; (2) training instructors; (3) provision of practical training in the work-place; (4) facility improvement in schools/centers; and (5) employment opportunity. However, in order to create linkages in these main areas at the service delivery level, there should be an institutional framework that formalizes this collaboration. In many cases, collaborations at the service delivery level do not occur systematically, but are typically informal and ad hoc-based.

TVET policies and laws should clearly define the roles of each party in the collaboration process. This lack of clearly defined roles limits effective collaboration at the service delivery level. In order to increase collaboration at the implementation level, the laws should clearly define the roles of TVET institutions, enterprises, and government agencies partnered with TVET, respectively.

Discussions: The successful collaborations between TVET and the industry share several features. First, institutions modify courses to meet the demands of enterprises while enterprises provide practical training to trainees in their workplaces. The second feature is the jointly developed curriculum and program. The third feature is the shared management structure that incorporates enterprise into these school management process. The fourth is the enterprise's provision of work-based practical training to instructors to update their knowledge and skills. There has been rapid improvement in partnerships between the two parties as they have begun to realize that effective collaboration brings them mutual benefits.

Recently, industry organizations and associations have been more actively participating in TVET from developing policies to delivering training because they now acknowledge that linking industrial production with training is the most effective way to increase productivity. In accordance with the enterprise, providers now view this collaboration as the best way to prepare their trainees for future employment. Several factors contribute to the success of these respective collaborations. First, TVET policies in Bangladesh have been developed according to the country's economic plans and policies. The government first developed economic policies, and then developed TVET policies to meet the new demands in the labor market.

Institutional frameworks at the service delivery level should be well-established. Without having practical mechanisms and a legal framework, collaborations can often become ad hoc, informal relationships. Therefore, it is important to formalize the collaboration based on the institutional framework that regulates various operational issues: the development of school governance, selection of board members, instituting key procedures in developing learning materials jointly, and existing mechanisms that will involve industry in training both trainees and trainers in the workplace. In order to increase industry involvement, it is important to provide either financial or non-financial forms of incentives to those who wish to develop collaboration. Lastly, the operational capacity of the provider is a necessary condition for successful TVET industry collaboration. In many cases, TVET institutions that lack in capacity rely on personal connections with the industry, which limits them in formalizing and expanding their collaboration with enterprises.

Conclusions: One of the major features of this collaboration is its emphasis on the preparation for trainees' employment. The pre-employment skills-development forms the main collaboration objective across all levels of education while research and innovation serve as a second main objective in the higher TVET sectors. Benefits are observed on both sides although there are issues to contend with of various forms. Issues relating to the sustainability of the collaboration initiatives are mainly the continuity of governance, a better understanding of multiple collaborators' needs and ensuring commitment in collaborative programs. Despite the challenges facing collaboration efforts, ensuring successful working collaboration is vital as they are essential for meeting the diverse needs of the education and industry sectors. Successful collaboration can be achieved with the right environment and supportive organizational structure; a win-win partnership towards mutual benefits for both sides

and the right people prepared to undertake new responsibilities collaborations so often require.

The successful implementation of any collaboration can be condensed into some key factors: clarify the purpose; follow function, involve the right people and get it in writing. Industry-wise university supervisor is a key factor in the successful implementation of the industry program. The industry-wise university supervisor can be seen as the 'bridge' in the industry-university working relationship. The supervisor is in the position to strike a balance between the requirements of the degree award and industry needs and ensure the candidate is not torn between the two as the meeting point in the industry needs and requirements may have to be negotiated sometimes. The students feel industrial training provides them with the 'reality experience' they can link to the theoretical knowledge that Universities or polytechnics exposed them to. Research indicates these industrial trainings do actually improve students' soft skills as expected [6].

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