Introduction

In the past three decades, the rapid changes in technology, economics, social, political, and cultural aspects of world imposed changes and forced reforms on many countries' educational systems. The focus of these reforms aimed to pursue effectiveness, continuous improvement, and future excellence of the schools. Educational scholars tended to believe that through educational reforms, schools would have inclusive collaborative structure, effective communication channels, integrated professional development, and learning focused leadership. Schools would be more adaptive to internal and external demands of the changing environment. Students in every school would be literate, numerate, and acquire a capacity for lifelong learning that would lead to successful and satisfying work in a knowledge society and global economy (Hall & Hord, 2001; Senge, Cambron –McCabe, Lucas, Smith, Dutton, & Kleiner, 2000; Wang, Haertel, & Walberg, 1993-1994; Wilkins & Church, 2002; Yuen & Cheng, 2000). As much work as appears to be occurring in providing visions to school reforms, substantially less work appears to be occurring in looking at current reality. Some educational theorists explain this gap between the desired vision and the current reality of these educational reforms as related to the rushed atmosphere in which reforms are undertaken (Lashway, 1998). Educational reformers had failed to prepare schools for the important transformation that major reform requires. They had not provided and implemented a detailed, structured, and disciplined transition plan that would transition people, process, and the culture from the old paradigm to the new one (Lick & Kaufman, 2000). Therefore, "If there aren't fundamental shifts in how people think and interact as well as in how to explore new ideas, then all the [reforms,] reorganizing, fads, and strategies in the world won't add up to much" (Senge et al., 2000, p. 20). In response to the failure of earlier reforms, educators have started looking at a new and comprehensive reform that is intended to foster school wide change that affects all aspects of schooling culture. Recently, a new comprehensive school reform strategy has been widespread. This kind of approach to reforming the school has come to be known as *learning schools*.

The Research Problem

Over the past twelve years, discussions regarding learning organizations have become extensive, diversified, and a popular idea in management, psychological, and human resource development literature. From the perspective of organizational theorists, "this is due to an attempt by many large organizations to develop structures and systems that are more adaptable and responsive to change" (Appelbaum & Goransson, 1997, p. 115). An organization will benefit from the learning of its individuals who, in turn, will contribute to enhance the organization's capacity to create the future of the organization as a whole (Ikehara, 1999).

An attempt to make the link between school reform and the concept of learning organizations has started recently. Often, the debate that has raged between educators during the past decade surrounding the idea of learning schools has at its heart fundamental disagreement about whether or not learning schools can be a successful comprehensive strategy for school reform. Some educators believe that teacher isolation, lack of time, and the complexity of teaching present significant barriers to sustained organizational learning (O'Nail, 1995; Lashway, 1998). In contrast, other educators talk about the need for schools to change from bureaucratic organizations to learning communities where school staff makes effort to learn, cooperate, and support each other (Fullan, 1993; Karsten, Voncken, & Voorhtuis, 2000).

This controversy among educators as to whether learning schools can be the new strategy for school reform has led to another strand of educators who argue that "[t]he persistence of calls for school reforms, along with the ambitious yet uncertain nature of that reform, has promoted growing support for the importance of organizational learning in schools" (Leithwood, Leonard, & Sharrat, 1998, p. 243). Therefore, the purpose of this study was to discuss the possibility of applying the five disciplines of learning organizations in schools to transform these schools to be learning schools. In this context, it is essential that the five disciplines develop as a system even though this is a challenge because it is much more difficult to integrate new tools than to apply them separately.

The Five Disciplines of Learning Schools

Learning schools is a phrase used to describe schools that possess the ability to change, grow, and adapt not by fiat, command, or regulation but by taking *a learning orientation* (Wyckoff, 1998). What fundamentally will distinguish learning schools from traditional and controlling schools will be the mastery of the five basic disciplines. The disciplines of learning schools are

vital (Senge, 1994). A discipline in this context means "a body of theory and technique that must be studied and mastered to be put into practice. A discipline is a developmental path for acquiring certain skills or competencies" (Senge, 1994, p. 10).

Personal Mastery

Personal mastery is perceived as a higher level of capability in the range of one's knowledge, skills, and attitude. It could be achieved through practice, self-analysis, reflecting, improving, and coaching (Hodgkinson, 2000). Personal mastery refers to a personal commitment of continuously clarifying and deepening personal vision, focusing energies, developing patience, and seeing reality objectively as possible (Senge, 1994). Therefore, personal mastery goes beyond competence, skills, and spiritual unfolding though it is grounded in competence and skills and it requires spiritual growth. It means, "approaching one's life as a creative work, living life from a creative as opposed to reactive viewpoint" (Senge, 1994, p. 141).

As a discipline that includes a series of practices and principles that must be applied to be useful, Senge (1994) suggested three principles and practices that lay the groundwork for continuously expanding personal mastery. The first principle is personal vision. Senge (1994) clarified that the cornerstone of this principle is the ability to focus on ultimate intrinsic desires, not only on secondary goals. "This, again, is why personal mastery must be a discipline. It is a process of continually focusing and refocusing on what one truly wants, on one's vision" (Senge, 1994, p.149). That is because "if people don't have their own vision, all they can do is 'sign up' for someone else's. The result is compliance, never commitment" (Fullan, 1993, p. 29) The second principle is holding creative tension, which is the gap that exists between where one is currently functioning and where one wants to be. Senge (1994) argued that negative emotions such as sadness, discouragement, hopelessness, or worry that might arise when there is creative tension are not creative tension itself. If we fail to distinguish emotional tension from creative tension, we predispose ourselves to lowering our vision. At issue is whether one resolves this creative tension by raising current reality toward the vision, or by lowering the vision toward current reality (Senge, 1994,). The third principle, commitment to truth, is a relentless willingness to erode the ways individuals limit or deceive themselves from seeing what is, and to challenge their theories of why things are the way they are. It also means continuously deepening the understanding of the structures underlying current events. "Once these structures are recognized… It becomes possible to begin to alter structures to free people from previously mysterious forces that dictated their behavior" (Senge, 1994, p. 160).

Leaders in schools have a key role to play in the discipline of personal mastery. They can set up conditions and context where people have time to reflect on their vision. They can direct creative tension toward taking effective actions and produce results. They can encourage and support establishing an organizational commitment to the truth wherever possible. And they can avoid taking a position about what stakeholders (including students) should want or how they should view the world (Senge et al., 2000). At the same time, to provide conditions in which teachers, students, parents, and other stakeholders can develop their capacity tcreate what they truly care about, principals must invest time, energy, and money far beyond what most principals today consider appropriate. Personal mastery implies a willingness to invest what is necessary to create an environment that helps teachers, students, and other stakeholders become high-quality contributors (Senge et al., 1994). Principals, teachers, students, and parents can create within their schools an ecology of reflection, growth, and refinement of practice--a community of learners (Barth, 1991). "A school that has turned itself into a community of learners is filled with daily examples of people learning from each other, sharing what they are learning, and being excited about and participating in what others are learning" (Collins, 2000, p. 25). Students have before them a consistent model of lifelong learners. They see their teachers and principal seek out learning opportunities. Teachers continue the examination and the refinement of their skills throughout their careers and they will always be involved with their colleagues in looking for better ways to teach (Collins, 2000). The principal occupies a central place in this community of learners not as the head teacher but rather as the head learner, engaging in, displaying, and modeling the behavior that is expected to be adopted by teachers and students (Barth, 1991). The real challenge existing here is for a school to develop a deep capacity among all of its stakeholders to be at the forefront of knowledge and skill in learning and teaching, which requires more than occasional in-service training or professional

development. It requires a systematic, continuous, and purposeful approach ensuring that each aspect of the workplace is conducive to efficient, effective, and satisfying work for all concerned (Johnston & Caldwell, 2001).

Finally, principals can be intent on fostering personal mastery by working relentlessly to foster a climate in which the principles of personal mastery are practiced in daily life among schoolteachers. "That means building [a school] where it is safe for [teachers] to create vision, where inquiry and commitment to the truth are the norm, and where challenging the status quo is expected" (Senge, 1994, p. 173).

Mental Models

Mental models refers to a person's deeply held assumptions, generalizations, or images through which he/she uses to interpret and understand the world and take actions. From a broad perspective, mental models as subconscious and taken-for-granted beliefs that limit our thinking about how the world works (Isaacson and Bamburg, 1992). "Very often, we are not consciously aware of our mental models or the effects they have on our behavior" (Senge, 1994, p. 8). They operate below the level of awareness and are a patterned way of acting, knowing, and responding to external stimuli (Calabrese and Shoho, 2000) Therefore, many new insights and opportunities fail to be put into practice because they conflict with deep-seated mental models (Appelbaum and Goransson, 1997). Mental models thus limit people's ability to change. As evidence, Senge et al. (1994) argue, "in any new experience, most people are drawn to take in and remember only the information that reinforces their existing mental models" (p. 67).

In the case of schools, it is argued that mental models limit principals' and teachers' abilities to change (Senge et al., 2000). They need a long and difficult struggle against the beliefs that are held by many of them (Barth, 1991). "Teachers act on intuitively held beliefs, but are unable to articulate them, or explain why they believe them. This is not surprising, given the lack of attention paid to reflection and dialogue in most schools" (Senge at al., 2000, p. 328). The mental models held by principals are often different from those held by their teachers. These differences mean that a meaningful dialogue, reflection, and sharing of thoughts and information between principals and teachers about day-to-day activities and long-term goals for the school are difficult to establish (Steiner, 1998). The culture of most schools instills fear of making any mistake; it is the blame and punishment that will ensue (Marsick & Watkins, 1994). "[T]eachers and principals have to deceive, go around regulations, play one group against others, and act as if they are not doing these things, in order to accomplish something that all agree would enhance teaching or learning in the classroom" (Argyris, 1993, p. 27).

The importance of recognizing the existence of these mental models in schools is not so that principals and teachers can replace theses present mental models with new ones, but to recognize the power of mental models to limit school people's abilities to think differently about what it is that they are doing and why. As educators, principals and teachers must develop the capacity to suspend their mental models long enough to seek out new knowledge which may cause them to revise their beliefs about what they do and why (Bamburg, 2001)

Therefore, modifications in principals' and teachers' mental models are required to provide a sense of creative tension that can power the wheels of meaningful change in schools (Lam, 2001). Such understanding can balance the reality of fear and anxiety in principals and their teachers with uncertainty that comes with the change in their mental models. And in the opposite, such understanding gives principals and teachers a sense of control over the change, contributing to their sense of comfort and security, and lessening their resistance to change (Lick & Kaufman, 2000-2001). The hope is that, ways can be devised to help principals reflect thoughtfully about the work they do. Then they can analyze their work, clarify and reveal their thinking through spoken and written articulation, and engage in conversations with others about their work. And they can reveal their extraordinary insights about their work, which they carry with them, are seldom explicit for them, and inaccessible to others. In the situation described, both principals and their colleagues will better understand their complex schools, the tasks confronting them, and their own styles as leaders (Barth, 1991).

Unfortunately, though this discipline offers the highest level for change, it is probably the most impractical of the five disciplines. It is, also, the most difficult place from which to start building learning schools. "It takes a great deal of perseverance to master this discipline, perhaps because very few of [the principals and teachers] have learned how to build the skills of

inquiry and reflection into [their] thoughts, emotion, and everyday behavior" (Senge et al., 1994, p. 240). Proponents of learning schools hope that principals will attempt to improve the quality of life and learning in schools by encouraging different ways of thinking about common problems. Such principals will transform school problems into opportunities for school improvement. They will encourage clarification of the assumptions that guide practice and will offer opportunities for shared problem solving and reflection (Barth, 1991).

Shared Vision

Scholars in management came to believe that building shared vision is vital for bringing people in any enterprise together to foster a commitment to a shared future they seek to create (Appelbaum & Goransson, 1997). Shared vision gives people a real sense of purpose that promotes focus, an excellent achievement level, and a long-term commitment to organizational effectiveness and survival because it reflects their own values and norms (Appelbaum & Goransson, 1997; Morrison & Rosenthal, 1997; Strachan, 1996). "A good vision is a prod that— if it is really powerful— creates a pull. It attracts commitment and energizes people, creates meaning in workers' lives, establishes a standard of excellence, and creates a bridge between present and future." (Espejo, Schuhmann, Schwaninger, & Bilello, 1996, p. 12). A shared vision is the first step in allowing people who mistrusted each other to begin to work together. With a shard vision people are more likely to expose their ways of thinking, express deeply held views, and recognize personal and organizational shortcomings. All that trouble seems trivial compared with the importance of shared vision that they are trying to create (Senge, 1994). In this context, vision means "an imagined or perceived pattern of communal possibilities to which others can be drawn, which they will wish to share, and which will constitute a powerful source of energy and direction within the enterprise" (Morden, 1997, p. 668). The discipline of shared vision, then, is the set of tools and techniques that bring all of these disparate visions of the people in the enterprise into alignment around the things people have in common (Senge et al., 2000).

In an educational context, there is simply no way to achieve educational excellence in a school where vision is blurred or where principals, teachers, students, and parents fail to communicate thoughtfully with each other. Vision is, without question, the glue that holds an effective school together (Boyer, 1995). Thus, the vision must be clear so that participants can find their role in the vision, know precisely what is expected of them, and determine when those expectations are being met (Snyder, 1997b).

At the same time, the substance of the vision must be conceptualized, described, and shared by the school people on the front lines: principals, teachers, students, and parents (Snyder, 1997b). Only then will the vision for school reform have the best chance to be taken seriously and sustained by teachers, principals, and other stakeholders (Bath, 1991, p. 150). Many researchers are finding a consistent relationship between the presence of teachers' and principals' visions and the effectiveness of their schools (Bath, 1991). However, a process of involving everyone together in deciding and developing the future of the school system does not mean taking people's input, selecting some of it, and discarding the rest. It means establishing a series of forums where school people work together to build the future vision of the school (Senge et al., 2000).

While many educators concur with the need to develop a shared vision for a school, there are several significant problems associated with it. The first problem is how to present the importance of vision not only as a conceptual model but also as a practical working tool. When using the process of creating a shared vision with stakeholders, it is important to remember that many teachers, students, parents, and even principals might not have been involved in a process like this before and might not have used conceptual thinking on a day-to-day basis (Hitchcock, 1996). Another problem is an over emphasis in some schools on building a school vision that could provide a false sense of security and prevent the effective development of the school. Problems arise in those schools that have a written vision and mission statement where no actual vision permeates the school. The vision never moves on from the written word into practice (Davies & Ellison, 2001). The third significant problem is that a vision can be misleading and can blind the leaders of the schools. Principals might pursue the vision in such narrow and defeating ways that some teachers and other stakeholders resist it until the principals leave the school. Or they might depend on their personal strength and presence to promote a fragile vision for short term. "Principals are blinded by their own vision when they feel they must manipulate

the teachers and the school culture to conform to it. Such a vision does not serve long-term development" (Fullan, 1993, p. 19). A fourth type of problems is the confusion associated with the terms vision, mission, purpose, and goals and the natural desire to separate and distinguish between all those terms.

Team Learning

It is becoming increasingly clear that individuals' learning within an organization is maximized through opportunities to share individual knowledge and experience with others. However, as work becomes more complex and as the consequences of decisions and actions involve greater risks, individual experience and knowledge become a less reliable basis for learning (Preskill & Torres, 1999). "Individual talent is great, but it walks out the doors…. Interdisciplinary teams capture, formalize, and capitalize talent, because it becomes shared, less dependent on any individual" (Stewart, 1997, p. 163-164).

On the other side, many teams, even with talented individuals who share the same vision for a while, fail to learn because they do not know how to work together. Alignment, when a group of people function as a whole, is the necessary condition for building a team. When a team becomes more aligned, a commonality of direction emerges, individuals' energies harmonize, less energy wastes, and synergy develops. Therefore, "[t]eam learning is the process of aligning and developing the capacity of a team to create the results its members truly desire" (Senge, 1994, p. 236).

Mastering the discipline of team learning in organizations is required today more than anytime before because almost all important decisions are now made in teams in direct or indirect ways. At some level, individual learning does not lead to organizational learning. Individuals might learn all the time and yet there is no organizational learning. By contrast, if teams learn, they become a microcosm for learning throughout the organization (Senge, 1994).

The process of learning how to learn collectively is unfamiliar with school people. In fact, collegial, cooperative, and interdependent relationships are the least common types of relationships among adults in schools (Barth, 1991). The problem is that school people do not draw parallels between students' learning, on one hand, and the teachers' collective learning on the other hand. Meetings at school that are not directly concerned with students are ranked bottom on a scale of attractiveness (Karsten, Voncken, & Voorhtuis, 2000).

However, research reveals that the most successful learning does, in fact, occur in schools where teachers find solutions together (Boyer, 1995). The educational literature, also, suggests that a number of outcomes may be associated with team learning. Decision-making and implementation of decisions tend to be better. There is a higher level of morale and trust among adults. Adult learning is more likely to be sustained. And "[t]here is even some evidence that motivation of students and *their* achievement rises, and evidence that when adults share and cooperate, students tend to do the same" (Barth, 1991, p. 31).

In a school context, the crucial key to team learning is time. Finding time to learn together is becoming increasingly difficult as teachers are asked to do much more than just teach. Therefore, principals should help provide time that is set aside for teachers to get together for their professional collaboration. It is recommended that teachers meet for several days at the beginning and at the end of each school year, and preferably get together at least once a week. Although bringing teachers together is easier said than done, many schools are finding ways to do it. "At the Key School in Indianapolis, Indiana, parents and other community members organize all-school assemblies or special projects for a half day each week so teachers are free to work together" (Boyer, 1995, p. 37).

Principals and teachers can use time as a productive tool to practice dialogue to develop collaborative thought, co-ordinated action, and collective inquiry into everyday experience and what they take for granted (Beeby and Booth, 2000). During the dialogue process, principals and teachers learn how to think together in the sense of analyzing a shared problem or creating new pieces of shared knowledge. More importantly, they learn how to think together in the sense of occupying a collective sensibility, in which thought, emotions, and resulting actions belong not to a principal or a teacher, but to all of them together (Senge et al., 2000). In the practice of dialogue the focus of the inquiry is on surfacing underlying assumptions and collective patterns of thinking in order to enable teachers and principals to examine and change their assumptions or theories behind their action (Beeby & Booth, 2000). Working together,

teachers uncover that they act on intuitively held beliefs, but they are unable to articulate them or explain why they believe them. This is because of the lack of attention paid to inquiry, reflection, and dialogue in most schools. "It takes time and practice— individually and collectively— to unearth and refine a new set of assumptions about teaching and learning that will influence the school's culture to move in new directions" (Senge et al., 2000, p. 328).

Based on the issues and challenges described previously, dialogue that includes inquiry and reflection helps principals and teachers overcome chasms caused by various specializations of grade level and subject matter. Inquiry promotes understanding and appreciation for the work of others. It helps principals and teachers create the ties that bond them together as a special group and that bind them to a shared set of ideas. Inquiry, thus, helps principals and teachers become a community of learners (Sergiovanni, 1994).

Systems Thinking

We live in a world of complex and interdependent actors. Our life calls for a successful interaction among subsystems. Few outcomes happen as a result of linear relationships and almost nothing happens on its own accord. Systems thinking provides tools for understanding systems and gives a new language for describing them. The most important element of systems thinking is the understanding that events are almost always the outcome of complex interactions among elements that hang together and continually affect each other over time and operate toward a common purpose (Morey & Frangioso, 1998). Organizations that focus on snapshots of isolated parts of its system will never get its deepest problems to be solved or a real change to happen. Systems thinking, therefore, is a conceptual framework that has been developed in an attempt to clarify how the patterns of interrelated actions among key components within a system affect the entire system and how to change them effectively. Systems thinking is a discipline for seeing wholes, patterns, and interrelationships and seeing the world as a whole as it grows more and more complex (Senge, 1994). Systems thinking "involves the ability to see connections between issues, events, and information as a whole or as patterns, rather than a series of unconnected parts" (Morrison & Rosenthal, 1997, p. 127). The key implication of systems thinking is that the emphasis is on a whole not on an activity or operation of individual parts. Considering a subsystem without considering the other systems that might be operating with it is a mistake (Hite, 1999).

Systems thinking in education is still relatively new phenomenon and requires lots of experimentation and trial and error. There is, also, no single right way to proceed. Educators enter this territory from every subject area and with wide range of experience. However, systems have been around forever, and the ability to think systemically is neither new nor mysterious to most educators. Systems thinking enables educators to see the big picture and the way parts interact over time (Senge et al., 2000). Applying analytical thinking in education has led to applications that reduce school performance. Principals might assume that if they use inherited analytical thinking models to maximize every part of a school, the school as a whole would perform at the highest level. This model of thinking is logical, only in the world of analytical thinking, but it conflicts with living synergistic social systems thinking. Most of a school's capacity to perform work is a product of the interaction of its parts not in its part. The act of separating a system into parts potentially reduces school performance. If school principals want to improve their schools significantly, they must use some method other than analytical thinking. Synergetic systems thinking is the tool of choice for the purpose of improving a school as a systems. Principals need to see schools for what they are: living synergetic social systems, and they need to understand how living synergetic social systems work. Once school principals start to focus on a school as a whole system and not fragmented parts, school improvement becomes possible (Green, 2000).

When educators, who care about school reform, wear a hat as systems thinkers, they will focus not only on particular practices but also on building collaborative relationships and structures for change. They will find a mechanism and process that allows people to talk across grade levels, departments, and schools within a system about how they want to reform the schools and what supports they need. They will involve local, state, and national government in the conversation, instead of just receiving mandates from them. And they will find a role for local business and community members to create a network of support for the school of which the school is just a part (Senge et al., 2000).

At the same time, expressed simply, changes integral to restructuring threaten the proponents of the traditional structure of the school and relationships within and between schools and their environments. The challenges presented to school principals from restructuring are perceived as being far from easily managed. For some principals and school-site administrators, particularly those whose earlier careers were forged under more traditional and centralized management systems, restructuring is perceived as threatening, whereas, for others, it is seen as unwelcome. Educators now face decisions as to which roles, relationships, and practices to retain; recently appointed school principals, with relatively little experience to call on, might strive for effectiveness in fast changing and unpredictable educational environments. Principals and teachers are expected to work more closely than ever with parents and local community members. Power and influence relations change between inside and outside stakeholders ─ principals, teachers, students, parents and local community members, district and central office staff and politicians. In short, restructuring changes both the culture and climate of schools (Dimmock, 1999; Leithwood, 1992; Murphy, 1991).

Systems thinkers hope that this restructuring and reculturing in schools will lead successful double-loop learning to occur. Teachers and other stakeholders are usually encouraged to occupy and keep a predefined place and role within the school, and are rewarded for doing so. Situations in which policies and operating standards are challenged tend to be exceptional rather than the rule. Under these circumstances, single-loop learning systems are reinforced and might serve to keep a school on the wrong course. Therefore, to encourage double-loop learning in schools, principals have to embrace the idea that in rapidly changing circumstances with high degrees of uncertainty, problems and errors are inevitable. They have, then, to promote openness that encourages collective learning, dialogue, and the expression of conflicting points of view. They have, also, to recognize that because genuine learning is usually action based, they must find ways of helping to create experiments and probes so that they and their teachers learn through doing in a productive way (Morgan, 1997).

Concluding Remarks

This study clarified that there are a number of confusions and complications in implementing learning schools as a new ideology and a comprehensive reform. Educators are clear that the five disciplines of learning schools sound like a great idea but they are confused how to implement them, how to get them started, and how to integrate them with all the changes and pressures imposed on schools from outside (Senge et al., 2000). Traditional schools with the old dogma of planning, organizing, and controlling are not designed to provide people in schools with the enabling conditions to lead them in expanding their ability to create the results they truly seek (Senge, 1994).

Change in schools, however, seems slow and difficult. Educational institutions have strong and rigid cultures that protect the status quo (Lick & Kaufman, 2000). "Those who have not worked within the institutions of education often do not appreciate just how disempowerd educators feel" (Senge et al., 2000, p. 33). Educators in response to a crisis or in the absence of crisis feel more trapped and less able to innovate (Senge et al., 2000). Change initiatives, therefore, encounter great resistance (Calabrese & Shoho, 2000). Conner (1993) simply put, whenever a discrepancy exist between the current culture of a school and the change objectives, all else being equal, the current culture always wins.

Therefore, to enhance and increase practicing the five disciplines in different school levels, there is a need to replace the existing operating governance systems in schools with collaborative governance system to complement competent and capable teachers. The role of the principal in the democratic governance structure is to promote the interdependence relationship among teachers and facilitate increasing the number of meaningful interactions among them. A democratic governance structure is designed to empower teachers and other stakeholders throughout the school by providing everyone with important needed information, the ability to make meaningful decisions, and the access to the necessary resources that fulfill their roles and functions (Green, 2000). Generally, power differences and communication structures in schools should be changed to support practicing of the five disciplines of learning schools.

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