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**THE USE OF COMPLEX ADAPTIVE THEORY AND  
INFORMATION TECHNOLOGIES TO INFORM  
DEVELOPMENT STRATEGIES IN ENGLISH SPEAKING  
BLACK COMMUNITY, MONTREAL**

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**ABSTRACT**

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**Aim/Purpose**      The purpose of this paper is to conduct a multi-case/agent analysis using complexity theory to develop propositions that guide and inform our research for solutions to the problems of integration and full participation of the English-speaking Black community in the societies of Montreal and Quebec.

**Background**      This study was motivated by our interest in community organizational leadership, and concerns expressed by Black social entrepreneurs and organizations in the English-speaking Black communities of Montreal. The results of an unpublished survey conducted by the Institute for Community Entrepreneurship and Development (ICED) revealed a strong perception among Black leaders that in spite of their efforts to advance their communities there was too little progress. They attributed this to systemic exclusion and competitive strategies of mainstream non-Black agencies and leaders. Our further investigation of these claims suggested that beside discrimination based on color and race, factors more complex than skin color, being a person of African descent or White hate, were at work. Preliminary patterns in our observations suggest that the problems of exclusion and discrimination needed to be addressed in a broader psychosocial sense and in the context of Canada as a complex political, economic, and social adaptive system emerging continuously from generation to generation.

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Methodology	We used historical analysis and dynamic systems constructs to understand the causality structures of human social systems and to design strategies that have the highest possibilities for improving and optimizing the objective and subjective wellbeing of members of targeted minority sub-groups in the system. The general research approach is deductive and exploratory. It conforms mostly to critical realist thinking as opposed to traditional scientific methodologies.
Contribution	It is our opinion that communication network centers can be designed as part of a strategic planning process to increase the capacity of minority communities for creating, in a timely manner, the ingenuity required for solving problems of social, political and economic exclusion; for promoting sustainable development and improving objective and subjective wellbeing. The use of the MAS (multiple-agents system) analytical framework allows us to address and assess problems of decision making under varying degrees of uncertainty and in the social and historical context of the study.
Findings	Our review of the development and progress of the Black community of Montreal shows that “under the radar” community based organizations and Black Social entrepreneurs have developed governance mechanisms and generated strategies and approaches to decision making that are consistent with the optimal patterns observed in simulations of multi-agent systems (MAS). In particular, social entrepreneurs seem to support the formal creation of community based communication networks and information sharing as essential for community development. Several of these organizations consider these useful tools for facilitating the sharing of innovative ideas and best practices.
Recommendations for Practitioners	The usefulness of the network community systems need to be monitored. Its usefulness will depend on how its outputs are perceived to have contributed to improving the level of fitness (the vitality and wellbeing/utility) of the community and its members. It will require a holistic approach to community development supported by network centers that provide communication and information services at levels that improve and sustain the capacity of the organizations and the community to adapt and evolve from generation to generation. The mechanisms in place must increase and sustain the capacity of the systems to achieve and maintain the desired level of outcomes consistent with attaining the highest fitness levels for the English speaking Black Communities. This must be tested with the help of information provided by a built in feedback subsystem of the network.
Recommendation for Researchers	A central database has to be built into the system where social and economic data and measures of subsystem specific attributes and characteristics are gathered and stored for use by the network organizations and social entrepreneurs. There is no comprehensive measure of a fitness index for the Black community in Montreal. Theoretically speaking, there are too many possibilities to find a precise solution. However, an approximation of fitness can be obtained by constructing a human development index (HDI) in combination with measures of inequality such as comparative data on income, employment and unemployment, poverty, and etc.
Impact on Society	The paper raises some questions about the success of the experiment of multiculturalism in terms of greater recognition of the contributions of Canada’s diverse and multiple sub-cultures. It proposes ways to address complaints of failed expectations expressed by Black and immigrant minority groups. The pa-

per offers policy makers and social entrepreneurs a dynamic analytical framework to explore the use of information and communication network theory, and information from simulations of multi-agent adaptive systems theory to develop more informed strategies and actions.

Future Research	More research needs to be done to improve the quality and expand the demographic and other data relating to the black communities in Montreal and Quebec. In addition, more research needs to be done on the development of an archival documentation system for the management and distribution of information between the different communities that make up the Black cultural community of Quebec and Canada.
Keywords	Complex Adaptive systems, minority communities, diversity, communication technologies, ingenuity gap, cultural change models, communication and informing system

## INTRODUCTION

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This study is exploratory. Its analytical framework draws on the theory of agent-based modeling of complex adaptive systems (CAS). The approach is inductive: we derive hypotheses about the outcomes a possible system that we believe to be most likely and descriptive of the situation at hand. We assume that these are true. This study was motivated by concerns expressed by Black social entrepreneurs and organizations in the English-speaking Black communities of Montreal as part of an unpublished survey conducted by the Institute for Community Entrepreneurship and Development (ICED). The survey revealed a strong perception among Black leaders that in spite of their efforts to advance their communities there was far too little progress made. They attributed this to systemic exclusion and discrimination strategies of non-Black mainstream agencies and leaders. Further investigations suggested that besides discrimination based on race and color, factors more complex than the fact of race and skin color, or being of African descent, were at work.

### *STUDY BACKGROUND*

While Statistics Canada classifies all persons of African descent as Black, this classification does not accurately describe the reality. It does not mean that functionally the community is a highly social, political and economic collectivity. Blacks belong to many separate groups: Blacks born in Canada, Blacks that are new immigrants; Blacks whose origins link them to many different countries of origins: from Africa; from every island in the Caribbean archipelago; from the USA, Latin American and South American countries, Europe, etc. Country of origin and loyalties to those origins constitute the largest cause for the separation of Blacks into closed sub-cultures. This apparent fragmentation supports arguments that what exists is a multiplicity of different cultures as opposed to a single community. Moreover, while for demographic purposes and social classification they are regarded as Blacks (a collectivity) these sub-groups have the right as individuals and groups to be treated as separate cultures under the Canadian Charter of Rights and Freedoms. This reinforces the tendency for these groups to separate and operate as closed cultures. They become hemophilic in their behaviors. They tend to develop structures that have poor internal communication mechanisms that do not share information across subcultures. This suggests to us that the problems of exclusion and discrimination need to be addressed in a broader psychosocial sense and in the context of Canada as a socially, politically and economically adaptive system. We postulate that it would be more enlightening to conduct this study in the context of the Canadian society as a social complex adaptive system.

### ***PURPOSE AND MERIT OF STUDY***

The purpose of the paper is to conduct a multi-case/agent complex analysis using complexity theory to develop propositions and search for solutions to the problems of integration and full participation of the English speaking Black community in the societies of Montreal and Quebec. We use historical analysis and dynamic constructs of human social systems to understand the causality processes of these systems, and design strategies that have the highest possibility of improving and optimizing the objective and subjective wellbeing of minority sub-groups in the social system. The general research approach is deductive and exploratory. It conforms mostly to critical realist thinking as opposed to traditional scientific methodologies, and the positivist case study approaches made popular by Yin (1984) and Eisenhardt (1989). More specifically, this paper examines the implications of the social, political and cultural isolation and fragmentation of the Black communities of Montreal on the overall objective and subjective wellbeing (fitness) of the members of these many diverse sub-cultures which for official purposes are classified as belonging to the Black community. The paper explores ways in which small or “under the radar” minority agencies can use the information and communication technologies to bridge the “ingenuity gap” (Homer-Dixon, 2001) between mainstream and minority communities. It studies the responses of community organizations to change; and generally, how they make decisions under increasing degrees of uncertainty. Then it compares them with theoretically optimal behaviors derived from studies on simulations of CAS agent-based models (Kobti et al., 2003; Gill, 2012 and 2015).

### ***POSITIONING THE STUDY***

There are two school of thoughts or sets of assumptions that are available and used in case studies. One set is drawn from the positivist paradigm or the purist school. The other from the critical realist paradigm or thinking that is more pragmatic. In studies of business and economics, the positivist analysis has been the preferred methodology. According to Piekkari (et al., 2010) traditional social and economic models have followed the scientific methodology using either the case study research methods made popular by Yin (2018) and Eisenhardt (1989) or the traditional business statistics and econometric methods. These approaches to studying business and the economy rest on assumptions of linearity in the relationships between the agents (individuals, cultural groups, organizations, institutions, ecologies, etc.) that are the variables/factors in the model. The requirements of equilibrium and the assumptions of linearity (decomposable systems) are necessary for deriving estimates and predicting outcomes. This is predicated on the positivist ontology, which assumes that reality consists of determinate relationships between constituent parts whose behaviors are objective and observable phenomena represented by the structural equations that define the system. In recent years there has been an increasing literature supporting the use of alternative models for cases in business, the social and natural sciences (Piekkari, et al., 2010). These alternative methods of analysis are based on realist thinking which is opposite in its view of the world to positivist theory. Realists argue that explanation and prediction is only possible in closed systems. They posit that in the social and natural sciences such conditions cannot be attained, because (a) the human agent has the capacity for learning and self-change; and (b) the modification of the social system by human action. That is to say, those social and natural systems are typically complex adaptive systems of the type that are evolutionary and co-evolutionary over time. The relationships associated with the large number of possible interactions between the factors that make up the system are non-linear. These factors are objective and observable because they are capable of evolving and co-evolving over time. In particular, the human agents have the capacity for learning and self-change; and for taking action to modify and transform their environment and system (Piekkari et al., 2010). Thus, estimates and predictions derived from the application of positivist type models tend to be unreliable. To overcome the theoretical problems associated with using traditional econometric type models to explain complex dynamic (non-linear) systems, new classes of models have been introduced and classified as multi-agent complex adaptive system (MAS) models as discussed further in the later part. This study examines the strategies and decision making of subcultures in Montreal and draws on the paradigm of critical realist

theory (Piekkari et al 2010). It is deductive in the realist sense and in part exploratory. It is flexible in its use of multiple methodologies. It uses complex adaptive modelling, multiple sources of mixed data (qualitative and quantitative). It uses qualitative descriptive method combined with a comparative historical analysis to explore the complexity of the social interactions and associations in the system. This allows us to get an insight to the causality of observable outcomes and define plausible propositions: make claims about the behavior of sub-populations and social system (Morais, 2010). The research strategy is essentially deductive in part. It enables us to determine whether the patterns emerging from the interactions and behaviors of intelligent human agents and their institutions are consistent with patterns observed in the computer-generated simulations based on complex adaptive systems (CAS and MAS) theory. Do the actual behaviors of the intelligent agents in these communities mirror those suggested by theory as the best for improving and maximizing fitness/utility. That is, do they make strategic choices and sustain activities that reproduce, preserve and perpetuate life and improve their wellbeing from generation to generation? How do co-operation and collaborating as opposed to competitive rivalry quicken the time it takes to attain higher levels of fitness? What do mechanisms best contribute to development? Our concern is not an analysis of the contributions of the information and communication technologies to GDP. It is about the use of communication technologies to quicken the access to new ideas for solving problems of social and cultural change in a complex adaptive social environment. To test and answer these questions we construct propositions about the outcomes of a possible system (a perspective and desired future) that we believe to be most likely and descriptive of the situation, given our theory-based propositions and the data available. We assume that these propositions are true. Then we make empirical observations on the outcomes that emerge from the interactions of our target sub-group with other agents in the landscape to see if they correspond to the patterns in the simulated system optimal out-comes. If they do, we conclude that the decision makers in the realm and actual world under examination are behaving in an optimal way. Therefore, we start from the general and overall premise that society is a complex adaptive system. Our focus is on the behavior of the many diverse subgroups of human species located in a complex environment and motivated by their will to life: survival, reproduction, the perpetuation and improvement of the quality of life (Dawkins, 2009), and the search for an ultimate meaning/truth (Frankel, 1997). More specifically, we explore how “below the radar” cultural minority sub-groups in the third sector (Below the Radar, TSRC Birmingham University, 2017) can use the information and communication technologies to inform their responses (decision-making) to change under various degrees of uncertainty in the environment. That is to say, to improve their capacity to gather and use information for improving their fitness (wellbeing), in both the biological and the psychosocial sense of the term. Our target experimental group is Blacks in Quebec, with the focus on the English speaking Black community of Montreal. This community consists of many cultures. Moreover, in those sub-communities Blacks are represented by three basic types of agencies: ethnic interest organizations which are sub-groups based on common socio-economic interests; ethnic political associations, groups based on a shared conception of the common good; and ethnic identity organizations, groups which are focused on the maintenance of the ethnic culture (Fennema 2004; and McCabe et al., 2010).

### ***WHY BLACK ENGLISH SPEAKING COMMUNITY OF MONTREAL***

The CAS multi-agent system allows the researcher to study multiple cases in a dynamic context. The approach and the propositions underlying the study can be generalized to other sub-cultures in the system. Then why the English speaking Black community? The study was motivated by our interest in studying the integration of immigrant minority groups in Quebec/Montreal societies and the role played by social entrepreneurship in that process. From the mid-sixties into the late nineties, Blacks represented the most important source of immigrants to Quebec. During that period, they organized and represented themselves within each sub-culture forming ethnic interest, ethnic political, and ethnic identity organizations. Our interest in the governance and management of small community based organizations made us aware of problems of exclusion and discrimination expressed by Black social entrepreneurs managing these community-based organizations in the English speaking Black

communities of Montreal. The Institute framed these concerns in an unpublished survey for Community Entrepreneurship and Development (ICED). It covered five key English speaking Black organizations: the Black Studies Center (BSC), the Black Theatre Workshop of Montreal BTW), the Black Community Resource Center (BCRC); The Quebec Board of Black Educators (QBBE); and DESTA Black Youth Project. (Survey of Black Organizations, December 2009 - 2010). The survey revealed a strong perception among English speaking Black leaders in Montreal that in spite of their efforts to advance their communities there has been far too little progress. They presented largely anecdotic evidence to support claims of systemic exclusion strategies used by mainstream non-Black organizations, institutions and leaders. An analysis of the survey responses showed that out of ten mostly University educated managers and Board members of the five key Black organizations, seven either agreed or strongly agreed that their organizations and their members believe that "Quebec and Canada are like a landscape with peaks and troughs. The high peaks offer the best views, the best air, and the best opportunity for Whites. Blacks and other minorities are barred from attaining these fitness peaks." 7 agreed or strongly agreed. Two respondents were indifferent and one strongly disagreed with the statement. Also 9 out of 10 respondents disagreed or strongly disagreed with the following statement: "your organization believes that , "In general, Black people feel safe in their neighborhoods, are respected, valued, well placed and are full participants in the Quebec society." Therefore, among the leaders of key Black organizations in the English speaking Black communities that at least their members and persons they engage and provide services feel that they experience and live low levels of objective and subjective wellbeing (fitness). In order to have a more in depth understanding of the meaning of this qualitative data, it is important to review the demographic, geo-political, and historic context for this study. First, we need to have a clear understanding of the definition of the Black community in Quebec; linguistic duality and rights, and multiculturalism as a state policy.

### **Canada: Geo-Political Context of the Case**

Canada is a country located in the northern part of North America. Its ten provinces and three territories cover 9.98 million square kilometers (3.85 million square miles). It is a vast geographic area with diverse eco-systems. It is a federal parliamentary democracy . The Constitution of Canada is the supreme law in Canada and outlines Canada's system of government, as well as the civil rights of all Canadian citizens and those in Canada. The Province of Quebec has and continues to use referendum protocols to separate from this federal parliamentary democracy. While this has been rejected by Quebecers, Quebec French leadership has been able to negotiate a special status for Quebec with respect to the protection and preservation of the French language and culture; and its comparative status to English speaking Canada. The Official Languages Act (OLA) came into force on September 9, 1969, making French and English equal status and the "official" languages, having preferred status in law over all other languages. However, The Charter of the French Language (French: La charte de la langue française), also known as Bill 101 (Law 101 or French: Loi 101) defines French, the language of the majority population, the official language of Quebec. It is the central legislative piece in Quebec's language policy. The divisiveness about this Bill has led to the creation of the OLA. The purpose of this Act is to (a) ensure respect for English and French as the official languages of Canada and ensure equality of status and equal rights and privileges as to their use in all federal institutions (b) support the development of English and French linguistic minority communities and generally advance the equality of status and use of the English and French languages within Canadian society; and (c) set out the powers, duties and functions of federal institutions with respect to the official languages of Canada. (Official Language Act R.S.S. 1985 c.31 (4th Supp: assented to 28th July 1988).

#### **Implications of the Act**

The language laws have serious implications for English speaking peoples and immigrant English speaking Blacks in terms of school of choice and education. It has deep negative consequences for employability and employment of Blacks. It also has major implications for communication between

French and English speaking Blacks and is consequently a significant contributing factor to fragmentation in the Black populations along linguistic and country of origin lines. Both the White English speaking populations and English speaking Blacks have resisted or challenged Bill 101 in the Supreme Court. Consequently, Bill 101 has been amended more than six times since 1977. Each amendment has aroused controversy over such provisions as the use of French on commercial signs or restrictions on enrollment into schools in the English-speaking school systems. The Bill has led to the creation of alliances of English speaking sub-populations in Quebec, such as the Alliance Quebec and the current province wide network of fifty 51 Quebec community group, including the Black Community Resource Center and its member organizations. A similar network exists in the English speaking Black community of Quebec: the Black Community Forum (1992-present). Thus, the complexity of the Canadian landscape is reflected in the nature of the interactions between diverse subpopulations, demographics, the political and cultural rivalries between French and English and a diverse number of other ethnicities and subcultures, the historical struggle of the indigenous peoples to regain their rights and freedoms and the rivalries between various levels of government. In such a system, communication is critical for system adaptation to take place. This suggests that the influence and impact of the communication technologies on the nature of the interactions between agents in the system is a serious strategic consideration in the study.

#### **Definition and Historical Perspective of Black Community in Quebec**

The estimated population of Blacks in Quebec was reported by Statistics Canada to be 243,625. Of this amount 151,220 were first generation Canadian, 61,195, second generation 11,210 and third generation (<http://www.midi.gouv.qc.ca/publications/fr/dossiers/RecueilStatistiques.pdf>: table 4). This represented 28.7 % of the visible minority total population of 850,235. It is the largest visible minority population in Quebec. It is 3.2% of the total population of Quebec of 7 732 520. About 44.7 percent of the Black female population speaks French and English and 10.4 percent speak English alone. 49.2% of the male Black population speaks both French and English and 9.6 percent speak English alone. That means that English is a very significant language of communication and expression in the Black population. But French is dominant: just fewer than fifty percent speak only French. In Canada and Quebec anyone who is of African ancestry and non-white is classified as Black (Census 2006) However, this must not be interpreted to mean that this classification for census purposes coincides with the definition of a community, as a group whose members share a number of characteristics and loyalties that bind them together in a distinct entity. The Black community of Montreal represents a very complex system of sub-groups on many dimensions: culture, race, multiple ethnicities and identities, language spoken (French, English, etc.), religion, traditions and philosophies, place of origin, histories, the balancing of loyalties between local national cultures and external origin cultures. This fragmentation is further reinforced by the fact that the Multicultural Act of 1971 allows Canadians the freedom to choose to be a member of any culture; and decrees that the country shall be administered as a bilingual, but multicultural country where all cultures are equal. So while for the purposes of this paper we shall use the general term Black to identify a person of African ancestry and who is not White in color (Census, 2006), it should be clear that there are many Black cultures and ethnicities. Also, being Black in the Canadian context must be considered culturally distinct from being Black in the American context, a distinction effectively made by professors Robin Winks (1997) and James Walker (1980). What is very important for this paper is the cultures and identities of Blacks in Montreal which constitute a very fragmented entity. They are an entity, more from the fact that the non-Black population racializes them. However, they tend to be closed sub-groups in terms of country of origin and hence culture and ethnicity. This poses two questions that we address later. The first is the problem of fragmentation (separation of an essentially single sub-culture in many smaller sub-cultures) which we will argue has a negative impact on the attainment of maximum objective and subjective wellbeing. The second has to do with communication between groups and the sharing of information as a strategy for improving the general wellbeing. We take the position that information sharing between social entrepreneurs (knowledge bearers and transmitters) within the Black communities and between themselves and mainstream Canadian

knowledge-based institutions, will increase the stock of knowledge and reduce the ingenuity gap between groups; and between them and the total social system. We argue this will increase the capability of the Black community and its members to overcome barriers to their strategies for attaining higher fitness peaks/ levels of wellbeing. In the literature review that follows later, we will address this further and in detail.

### **Historical Perspective: A Comparative Historical Analysis**

From the seventies through to the eighties, constitutional changes at the Federal and Provincial levels of Government legitimized and gave legal force to the pursuit of a more equitable, multicultural and or pluralistic society. The Canadian Constitutional Act in Article 27 actually states that Canada is to be governed as a Multicultural State (Canadian Charter, 1982). Notwithstanding these normative changes and update of what was considered proper and right in the private and public spheres (belief space), there is significant research evidence that lend credibility to Blacks perceptions of exclusion and the belief that a negative status is being assigned to Blacks in Quebec. In October 2001, The McGill Consortium for Ethnicity and Strategic Social Planning issued its first of two reports on the level of fitness of the Black Community of Montreal (Torczyner et al. 2001). This was followed by a second longitudinal study in 2010 based on the 2006 Census. Professor James L. Torczyner and his team (2009) collected and compared fitness indicators (income, educational attainment, gender ratios, size of labor force, labor force participation, poverty levels, home ownership, family structure ) comparing the two census years 1996 and 2001. From the data, he drew the conclusion that Blacks continued to lag significantly behind non-blacks on every success indicator. This corroborated the findings of the Quebec Government Task Force Report on the Full Participation of Black Communities in Quebec Society, released in 2006 (Task Force on Blacks, 2006). Also, Bayne (2008) showed that over several censuses a complex set of social, political, cultural, and preferential race based barriers operated to minimized the effectiveness of the social and economic strategies used by Black social entrepreneurs to improve the well-being of Blacks in Quebec (“Statcan Census Employment Figures , Spring 2010). Both Bayne (2013) and Torczyner (2010) pointed out that between 2001 and 2006 there was some evidence of growth and positive change with respect to some indicators , but expressed concern about the dramatic disparities in income and employment for given levels of educational attainment. Moreover, they were concern about the levels of poverty among Black women and children; the low levels of savings and capital asset ownership; and in general, the exceptionally slow pace of integration of Blacks into the economic and democratic decision-making processes of Quebec. The Quebec Government Task Force Report on Full Participation of Black Communities in Quebec Society (2006) also highlighted these problems faced by the community. Moreover, studies done by Andrew and his team (2005) in collaboration with the Ministry of Education ( Quebec) showed that English speaking Blacks in the French School system by the decree of Bill 101 are in part under-performing as a result of systemic biases against them (Jacqueline , 2010).

### ***DIRECTION OF RESEARCH APPROACH***

Apart from indicating a need for corrective social action, our research take a fresh look at these system outputs and issues of system discrimination and exclusion by studying them within the framework of Quebec as a complex social, cultural and economic landscape. Thus, we decided to shift the focus away from a unidimensional approach based on anti-racist policies and action to a multi-dimensional dynamic approach. In this sense, we view the Black community as a complex adaptive subsystem, among and interacting with other subsystems or agents. In this approach, the community is viewed as an agent capable of self-change and acting to change the system. The community and its members are evolving and co-evolving, adapting to internal and external changes as members and their agencies search to find novel ways to increase the chances for the survival and perpetuation of the life, and the wellbeing of the largest number of members of the community. We view the problems facing Blacks in Quebec as having to do with the community maintaining its growth and vitality

as well as improving its wellbeing. Thus, we draw on the research outcomes of complex adaptive systems (Kauffman, 1993) to justify the case for a strategy of collaboration and collective action in the larger system. It also helps us at any given time, to understand how information and communication technologies can be used to increase the capacity of the Black community to overcome system barriers and competitive counter strategies in the Quebec and Canadian fitness landscapes.

### **CAS and Critical Realist Thinking**

Complex adaptive system approach provides a computational and holistic structure for critical realist thinking about human social systems. SAS consists of relationships, emergence, patterns and iterations. It is characterized by many variables and their properties. A key property of such a system is that it emerges because of the apparent random interactions and connections between agents (humans, organizations, kinship groups, water, air, flora, fauna, animals, etc.) in sub-systems and in the system as a whole. The system is adaptive and emergent at all levels. In a social human system, the life and wellbeing of the human person as an “intelligent” agent is dependent on their capacity to observe and interpret patterns formed by interactions between themselves, other agents and ecologies that with themselves make up the landscape. These interactions trigger adaptive (accepting and influencing) decisions and actions by the “intelligent” agent in response. These responses can be of a self-changing nature or action on the system. They are influenced by the strength of the cultures of the groups (how closed they are); by their propensity for collaboration, and the tolerance for diversity of perspectives. Perhaps the most important is the capacity of the intelligent agent for learning and action: the creation and updating of knowledge, and the capacity for innovation and ingenuity. Thus, the use of agent-based modeling allows us to consider the effect of competitive and collaborative behaviors, information sharing, and the increases in knowledge and ingenuity capacity on the capability of intelligent cultural agents (individuals, kinship groups) to reproduce themselves, increase their growth and improve their wellbeing at the highest possible socially acceptable and environmentally sustainable levels. The paper postulates that knowledge creation and dissemination, communication and exchange are essential to the advancement of all groups seeking to attain greater fitness (locate and reach the top of the fitness peak with the largest total utility) in an environment. It establishes this from the literature of MAS and CAS systems. It incorporates the Stuart Kauffman’s complexity catastrophes principle as the basis for evaluating the tolerances for fragmentation versus the benefits of strong cultures under varying degrees of uncertainty. Excessive fragmentation into sub-cultures may cause the clustering of communities around low fitness levels (The Stuart Kauffman’s complexity catastrophes).

### ***THE ENGLISH SPEAKING BLACK COMMUNITY AS A COMPLEX ADAPTIVE SOCIAL-SYSTEMS***

The English-Speaking Black community of Montreal can be considered to be one among many agents in a complex Canadian social and cultural complex adaptive system. As a sub-group, it has its own internal environment that distinguishes it from other subsystems or agents. It is not a homogeneous monolithic cultural group. It does not conform to the conventional definition of a strong culture in which all members of the group share a significant number of the components of culture uniformly, nor is it exhaustive in terms of the extent to which these components influence the behavior of all the members. It consists of many subcultures that link their members to Africa, various Caribbean island cultures, Canada and other countries or continents. This diversity within the group is a direct result of patterns and sources of migration and immigration and the rapid rate with which that has occurred over the forty year period 1960-2000 (Bayne, 2008; Mensah, 2010; Torczyner, 2010). Culture and country of origin differences have led to tension between sub-groups that compete with each other for recognition and resources; and to conflicts of identities as each subgroup exercises its constitutional right to remain loyal to origin cultures: Haitian, Jamaican, Ghanaian, Nigerian, Trinidadian, Africa-American, etc. The result often is what we will define as fragmentation of

voice and responses, even when challenged by system generated negative forces affecting members of any of the subgroups that by a socio-political process of racialization are classified to the single cultural class of Black. In this paper, we assume that in any complex adaptive human system a strong culture is a necessary but not sufficient strategy for the survival and development of any subgroup and the retention of its origin identity. Therefore we postulate that the larger the number of persons that share the same values, traditions, and vision the greater the possibilities that they will succeed or outperform their competitors on the fitness landscape and improve their fitness, in the biological sense of fitness (reproduction, preservation, perpetuation and evolution from generation to generation). However, this proposition raises the following questions, which this study attempts to answer. If the above proposition is true, what kind of structures and institutional arrangements are necessary to unify the many sub-cultures that constitute the Black community of Montreal? In a society where all cultural and diverse origin groups have the constitutional right to retain origin cultures or choose alternative cultures (Canadian Constitutional Act 1982), how can we create a strong and more culturally comprehensive larger group from among a loosely linked set of smaller subgroups? How can we enhance their capacity for producing sufficient ingenuity in order to effectively inform their search decisions/planning and strategies for improving the fitness of the group? What are the potential net benefits of creating collaborative network systems that are based on shared beliefs and norms? What is the likelihood that such a network would sustain the vitality of the group and move its members to higher levels of existence and/or better life styles? How will we go about this?

The paper proposes ways in which the information and communication technologies can be used to reduce the negative impact of fragmentation: low levels of development resulting from the lack of access to new ideas and or the capacity and capability to generate new ideas to solve new problems. "Ingenuity gaps" develop between groups/sub-cultures due to this lack of access to knowledge and information.

### ***THE INGENUITY GAP***

A gap in ingenuity between groups is one of the significant reasons of why a strong culture that remains closed may not progress in the objective sense. In his book, *The Ingenuity Gap*, Homer-Dixon (2001, 19-33) states that population explosion, urbanization, and rapid growth in technology have increased the complications of human societies and organizational decision-making. He proposes that to manage and solve the problems societies need to be able to create knowledge as new ideas (ingenuity) at a much more rapid rate than in the past. He states that "to one degree or another, all human societies are locked into a race between a soaring requirement for ingenuity and its uncertain supply", and concludes that where gaps develop between the need for ingenuity and the supply of it, disaster sets in (Homer-Dixon, 2010). Based on these propositions and the inevitability that Homer-Dixon assigns to a global increase in the ingenuity-gap, one might expect that to avoid death intelligent life will act to reduce the level of complexity to a more tolerable level. In fact, this is what Stuart Kauffman (*The Origin of Order*, 1993) believes is likely to happen in a complex adaptive system. Thus, we argue in favor of a reduction in complexity by increasing collaboration between sub-cultures. Thus, we propose that Blacks and other minorities in urban settings would benefit from the use of the information and communication technologies and gain greater advantage by creating better informing mechanisms and processes. If Blacks effectively eliminate the effects of exclusion/ the "color line", they must as a strategy gather, update, and use knowledge to reduce any ingenuity gaps that act as barriers to their initiatives to improve their fitness. As we said above, information sharing between the many Black communities (consisting of Canadian born and many immigrant Black groups) and between themselves and mainstream Canadian knowledge-based institutions, is essential for increases the stock of knowledge and reduce the ingenuity gaps within; and between themselves and the overall system. The overall objective of the research is to find effective ways to facilitate the transfer of technology and knowledge between groups that are located at higher fitness

peaks to centers in those communities located at lower fitness peaks. More specifically, in order to strengthen English speaking Black organizations, there is a need to reduce gaps in their ability and capabilities to generate new ideas to solve problems of development. In part this requires that there is an increase the exchange of information between Black community-based organizations (social entrepreneurs) and institutions of higher education, with greater knowledge creation and updating capacity and capabilities. This universities and other research and information bearing agencies become very important nodes in the system. Because of the complicated and complex nature of the interactions and connections between minority communities and mainstream society, we propose an action oriented research approach that allows Black community organizations to respond more effectively to unexpected and novel changes or increases in uncertainty in the fitness landscape. This permits “real time” incremental adjustments to the search rules and strategies used to realign the real world system to an approximation of the best-desired result. This requires interventions and constant interaction with the managers of community organizations in the study over time as the system converges to some ideal. A network communication system makes that real time intervention possible. Our concern is not an analysis of the contributions of the information and communication technologies to GDP-determined economic growth. It is about the use of communication technologies to quicken the access to new ideas for solving problems of social and cultural change in a complex adaptive system

## **REVIEW OF RELEVANT LITERATURE**

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### ***MODELLING COMPLEX ADAPTIVE SYSTEMS (CAS)***

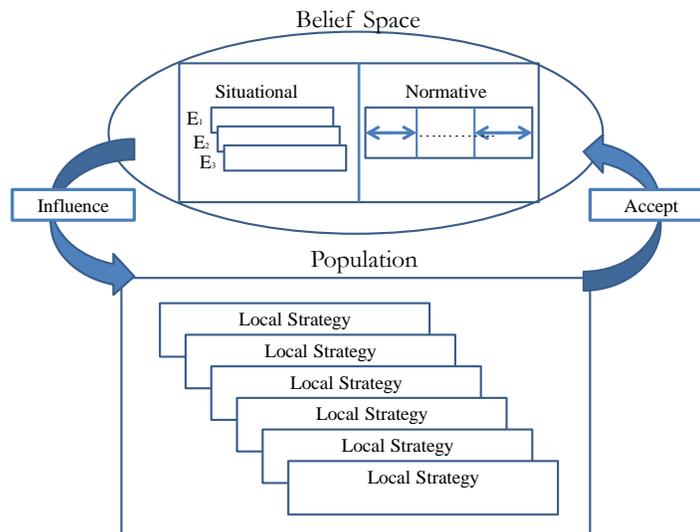
There are three main approaches to modeling complex adaptive systems: agent-based modeling, networks and cellular automata. Of the three approaches, agent-based models are the most interesting. They allow us to study the effect of collaborative behaviors, information sharing, and the increases in knowledge and ingenuity capacity on the chances for the survival and evolution of sub-cultures in turbulent environments. This includes environments in which the dominant main-stream cultures are closed, or prefer to collaborate only with cultural groups that most closely resemble them over a selective range of kinship attributes and common cultural and historical experiences (i.e., under conditions of systemic discrimination). In its most general form, a complex system consists of many components or agents that interact and connect with each other in unpredictable and unplanned ways. From this, mass of interactions regularities emerge and start to form patterns that inform the agents within the system and the behavior of the system itself. These systems are emergent and co-evolutionary. Because the agents are a part of their environment, when they change, they change their environment, and as it has changed they need to change again, and it continues in unpredictable cycles of varying amplitudes and lengths of time (Fryer, 2017). In such a system prediction and estimate is not possible. However, bounded rationality tells us that a complex adaptive system exists between two extremes; equilibrium and chaos. Complex adaptive systems (CAS) cease to be adaptive when the system is in a state of equilibrium (steady state) and cease to function as a system when the system is in a state of chaos. Bounded rationality also tells us that intelligent life can reasonably be expected act to optimize fitness when the system is in a state close to chaos. The conclusion is that humans function most efficiently and effectively at the edge of chaos (Kauffman, 1993) where they are constantly challenged to be technically and socially ingenious. Disaster strikes most severely when we lack the time and capacity to adapt to the best fit possible. This is certainly true of human societies where the changes in the global environments are so rapid and chaotic that humans lack the capacity or ingenuity to respond in time and effectively to avoid disaster or act to mitigate its negative effects (Dixon, 2001). A special aspect of human complex adaptive systems is that human agents are capable of learning and creating new ideas for solving problems: constructing “sets of instructions that tell us how to arrange the constituent parts of our social and physical world in ways that help us achieve our goals”: reach higher levels of fitness (Homer-Dixon, 2001). Homer states that when a society cannot create sufficient ingenuity as fast as required to meet its needs, it develops an ingenuity

gap between what is required and what is actually supplied. Societies or systems with severe ingenuity gaps cannot adapt to or mitigate stresses in their environments. The same is true of cultural sub-systems in a society. In such situations the system emerges into chaotic behavior patterns, and mass migrations, riots, insurgencies and other forms of social disorders take place (Homer-Dixon, 2001). Given the non-linear dynamics of the interactions between agents in complex adaptive human systems, the randomness of events, and uncertainty of the level of their initial impact, predicting outcomes in CAS environments becomes extremely difficult and unreliable. Notwithstanding the above arguments, the study of natural and social complex adaptive systems enables us to distil general properties and processes associated with these systems that are very useful in thinking of the world around us. CAS theory provides a conceptualization and framework for a class of complex systems and their resulting phenomena. Studies of CAS provide us with computational tools (computer algorithms for deriving simulations) and a set of insightful principles deduced from the behavior of the system (Brownlee & Jason, 2007; Holland & John 2006) that we can use as guidelines for determining what decision search rules to apply in an evolving landscape. Thus, to assist our thinking, we have borrowed from the work of scholars conducting research on agent-based modeling of cultural change. The overarching intent is to get an informed sense from the simulated results of what the impact is likely to be on a system's configuration and its objective and subjective wellbeing function (fitness) when cultures change in a landscape (set of ecological sub-systems). The works consulted are "Growing Artificial Societies" by Epstein (1991), "The Origins of Order" by Kaufman, (1993) and key articles in the field by Kobti et al (2003) on agent-based modeling and multi-agent simulation. We have elected to use the simulated results of Kobti et al to set up the structure of the model because of the clarity of their exposition. Moreover, their use of the intelligent agents as culture bearing kinship networks approximates racially constructed sub-cultures. The algorithms capturing the decision-making processes and large number of computer generated possible combinations of factors producing utility make the patterns observable in the simulations more generalizable. Therefore the results are more useful in helping us to get a better understanding of global or emergent outcomes specific to the target group for this project (Blacks in Montreal and Quebec). The model-simulated results act as proof-of-concepts about culture retention, the role of kinship networks in the adaptation process and as informing channels. It helps to understand leadership as an entrepreneurial function in the system. It allows us to think more clearly about the arrangements of kinship and social culture systems that have the best chance of surviving in the face of negative environmental changes (social, economic and environment disasters). We believe the approach is relevant for informing local, national and international policies on sustainable social and economic development. This can be visualized in the context of the world challenges of equity and sustainable development: developing and managing (1) population and human resources; (2) food production, distribution and exchange; (3) species and ecosystem preservation; (4) consumption patterns; (5) agricultural and industrial practices and (6) rapid urbanization (The World Commission on Environment and Development, 1987).

### ***AGENT-BASED MODELING: THE THEORETICAL FRAME WORK FOR AN INFORMING SYSTEM***

Based on the cases and simulations reviewed, we propose the creation of a communication network system to bridge the gaps in information flows. It is hoped that such a network will act as an informing mechanism to increase information flows within and between the English speaking Black communities and mainstream networks. Feedback loops in the system will allow us over time to test the following research hypothesis: barriers to community development. Especially in the Black communities of Montreal, the less development is partly a result of weak channels for sharing information within the sub-group cultures and between them and the mainstream cultures that have larger stocks of knowledge and greater capabilities for supplying ingenuity when needed. Kohler and his colleagues define an agent-based model as consisting of two spaces, a belief space and a population space (Figure 1). The belief space is like the brain of a complex system. This is where patterns are

sensed from the masses of interactions in the system and stored as knowledge. It is the repository of knowledge. Some knowledge takes the form of facts and basic skills, which are fixed at any given time and place. Some can be updated and learned over time. Fixed knowledge may be topographical, temporal or historical, and the current level of skills and inventory of ingenuity in the population. Global dynamic knowledge is generated by the collective experience (the successes and failures) of the most effective and efficient social and economic entrepreneurs, in the sub-groups and population. This is generalized knowledge accumulated in the belief space for use by current and successive generations. This knowledge is of two types, situational and normative. These are the two dynamic factors responsible for change, self-regulation and adaptations in the cultural framework. It is debatable as to whether normative knowledge is arrived at through the success-failure experiences of the population or transcendently or both. We will simply take it to be generalized knowledge about what ought to be or should be that is accumulated and validated by the population in some collective sense (an acceptance process). It is used as a reference or guideline in making or influencing decision-making, planning and implementation. The latter processes also use situational knowledge of both a global and local nature (the art and science of knowing and doing). Normative knowledge is updated in terms of the new experiences of the population. Cultural knowledge, which may be specific to particular sub-groups, is also accumulated and used to communicate information that facilitates self-adaptation at the level of the population space. It legitimizes activities and controls population and sub-group behaviors. The normative process helps to define the ideal personalities to which we aspire and how we relate to each other in the population space. In the population space households/agents interact and engage in a complex set of dynamic social and economic behaviors that determine the types of groups and the nature and structure of those groups; what is produced, how much, when, and where; who gets what, how much and when; and what is the socially desirable distribution of resources, goods and services. The topographical dimensions of the landscape are themselves complex and evolving such that decisions and choices are made by the agents/households under varying degrees of uncertainty generated by external changes. Interdependencies in the biosphere contribute to the creation of a recursive or self-adaptive system.



**Figure 1: Cultural Framework**

In this model (Figure1), the central purpose of population activity is the survival and reproduction of itself. Fitness is therefore understood in the biological sense of reproduction, survival, perpetuation of life or evolution. The survival of the species is achieved through the innovative use of knowledge derived from the success-failure experiences of exemplars in the population. In its most rudimentary form the system achieves its central objective within the framework of a culture and kinship networks and a process of social entrepreneurship. In this adaptive system production is for the preservation of life and improving the fitness of the kinship and cultural groups; not for the accumulation of private profit. There is a compassionate distribution mechanism in place. Surplus food (grain) is shared on a needs basis. A review of the literature on MAS systems by Sarker and Ray (2011) presents the social entrepreneurs as agents responsible for actions and behaviors that guide the system in solving problems. In such a case, a genetic algorithm may be used to determine the set of functions for each agent; or an appropriate learning algorithm may be designed and assigned. In some cases, the agent could be a sub-system (community network organizations) that builds a solution, moves over a landscape, to communicate with other agents, to be active (i.e. goal oriented) and possibly to be adaptive. A second type of situation is when individuals in a system are considered as agents that represent a candidate solution (have needs to be satisfied). In addition, such an agent may also store agent specific information, such as agent learning techniques, learning rates, etc. To enhance performance, each agent may invoke a set of operators such as competition, cooperation, being proactive, self-learning. Competition resembles scenarios in classical, neoclassical and emerging market situations; it identifies the winners and losers, and replaces losers by new agents generated by the system. Cooperation is an information exchange mechanism through the cross over operation. Self-learning could be based on local search techniques or rule-based analysis. In such systems, it is possible for a cultural /ethnic group to disappear and be replaced by other groups. Genocide which is an extreme and aggressive competitive search mechanism has as its central objective the elimination of the "other." Cooperation and collaboration has the opposite as an objective.

### ***RELEVANT RESULTS AND PROPOSITIONS FROM STUDIES REVIEWED***

Tim Kohler and his team carried out a number of exploratory agent-based modeling studies of the settlement and farming practices of the Pueblo Indians of Southwest Colorado over a three-year period 2000-2003. The initial study, the multi-agent village simulation, was developed by Kohler (2000) to simulate the effect of negative environmental changes (drought) on the capacity of the group to sustain its culture and survive in the region. The team proceeded to update the model by adding economic factors, exchange, cooperation and learning rules. They then observed the impact of learning, collaboration and exchange on the resilience of the community. They used a cultural algorithm to simulate a socially adaptive and self-regulating system to mimic imagined behaviors and events in the Pueblo Village. As they updated the model, the simulations progressively produced larger and more complex system with greater interdependencies and more responsive and adaptive to external change (Agent-based Modeling, 2003). This suggested to us that the model had meaning for an exploratory study of ways that the Black English speaking communities, as well as other minorities, could improve their level of fitness in the Quebec fitness landscape.

More recently, Gill (2012) employed a multi-agent adaptive systems analysis based on the Kauffman's (1993) NK Landscape to study the impact on fitness that are likely to be the result of different types of decision making strategies of different categories of intelligent agents under conditions of increasing uncertainty. In the article, he produced simulated results showing the performance of four different types of agents: random, expert, imitating and goal setting. The results show that as the ruggedness of the landscape increases (as agents/social entrepreneurs face greater and greater complexity), those agents that were able and willing to access information from other agents and learning mechanisms performed best. These agents tended to belong to strong but not closed cultural groupings. Goal setters outperformed all categories of agents. They were the most successful in improving their fitness on landscape under increasing degrees of uncertainty. Gills simulations show

that their success was associated with the fact that they acted by setting clear goals and exploring the landscape using advice and or information obtained from observing and imitating neighboring groups/agents. Thus in the survival, growth, vitality and life perpetuation sense of the term fitness, goal setting strategies out-performed all others types of agent types because they accumulated and retained information and knowledge and followed a strategic plan of action aimed at a perceived future. Random hill climbers did worse because their strategies are random and based on trial and error. They are closed to learning from others. Experts did poorly when the level of uncertainty was very great and change so rapid that the past and present contain little or no information about the future. Gill's simulations showed that even when there is not contact with many other agents (when there is low information visibility) that the imitating and goal setting agents substantially outperformed the remaining types of agents in terms of the number of program steps (time). It will also take to get to fitness and in terms of the level of cumulative fitness as soon as the uncertainty and complexity become significant (Glendon 2012). Thus, according to Gill's simulated model it is reasonable to expect that participating in a strong culture will enhance our search for fitness on "rugged landscape (under significant degrees of complexity) provided we seek to improve our fitness by imitating others and to use strategies that have long term goals. Thus from the results he makes the interpretation that the goal setting agents that accept drops in fitness in pursuit of known goals, continue to benefit from the successes of other groups and to learn. They display a willingness to "step outside the short term adherence to culture when there appear to be fitness benefits of doing so (Gill, 2015). These findings of Gill seem to corroborate the simulated results based on the agent-based modeling carried out by Kobti et al (2003). They seem to support the propositions of Kobti et al which, the larger the stock of ingenuity (the larger the knowledge base), the more frequently knowledge. Moreover, new ideas for solving problems are shared across groups, the more instances of collaborations within and between kinship groups, the greater is the resilience of the system, and the larger the size of the network nodes the social and cultural system can be expected to support. That is, the greater the amount of complexity the system can tolerate. In general, increased levels of learning (situational and normative, technical ingenuity and social ingenuity or intelligence) produced a more resilient system able to make better recoveries from disaster. It is noted that this is achieved by greater dependency or connectivity between sub-groups (Kobti, et al. 2003). This view is consistent with findings of Stuart Kauffman in *The Origins of Order* (1993). Kauffman in his NK model of evolution posits the argument that the character of the fitness landscape (its ruggedness/uncertainty and number and heights of peaks) bound adaptive evolution. But that character is in turn dependent upon the agents that are evolving. Entities that evolve as fractured subcultures increase the number of conflicting constraints on the system and create conditions that do not allow adaptive evolution to be optimized, This situation is described by Kauffman as the result of "complexity catastrophes" (Kauffman, 1993). This has significant information as guidelines for the leadership in the actual world situation. For this, the leadership must act or activate the plan of action to bring essential causal entities (factors) together to produce the desired outcomes. The agent-based analysis makes exemplars (knowledge bearing innovator agents) responsible for dynamic change in knowledge accumulated in the belief space for use by current and future generations. Exemplars are considered the true agents of change and growth subject to societal values that are global (moral and cognitive legitimization). Thus, the model defines, in our sense of the concept of a social entrepreneur. Since their function is continuously, engage in increasing the fitness level across kinship groups, and not the accumulation of wealth: the social entrepreneur is motivated by the will and the urgency to act to survive and to perpetuate the existence of the kinship group, not solely by the private and personal benefit of his/her acts. Nevertheless, the social entrepreneur is not necessarily a single person. For the purposes of this paper, the social entrepreneur assumes an organization or network (Bayne, 2008).

***A METHODOLOGY: BUILDING A RESULT BASED COMMUNICATION AND INFORMING SYSTEM***

Our research and analysis strongly supports the view that access to information (knowledge), having the capacity and capability for innovation (ingenuity) are critical factors for the success of any kinship or cultural group navigating the fitness landscape. This is particularly true for the diverse groups in the Canadian Multicultural state. We postulate that groups need to develop programs that increase access to greater education resources and skills acquisition. They need to set up improved communication network systems to assist in the greater dissemination of knowledge; greater communication and collaboration across kinship and cultural groups, and strong support for the social entrepreneurial spirit. They need to participate more fully in the general movements for the development of a moral framework and strategies for attaining socially cohesive and sustainable communities and society. Therefore, we decided to construct a results based management communication network system linking key organizations in the English speaking Black community of Montreal. The central network mechanism will be a portal with the capability for logical network analysis. The planned network will constitute a set of online communication centers providing information and learning resources requested by the Black community organizations (ICED Survey, 2010). The system will use a feedback function to update and improve the flow and quality of information and promote greater communication between members of the network with mainstream networks and knowledge creation institutions. At John Molson School of Business, Saade et al. has been working on the development of an online learning model which links community based centers within a communication-learning network. There may be many different centers, each one or clusters of centers addressing a range of problems and issues affecting the well-being of a community. Figure 2 illustrates the proposed linkages and information flows between the key organizations.

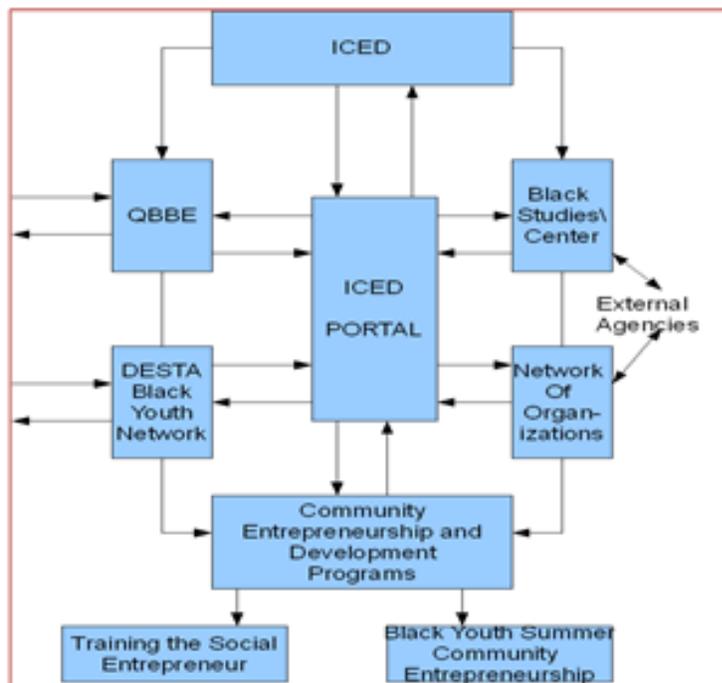


Figure 2: Communication and planning chart

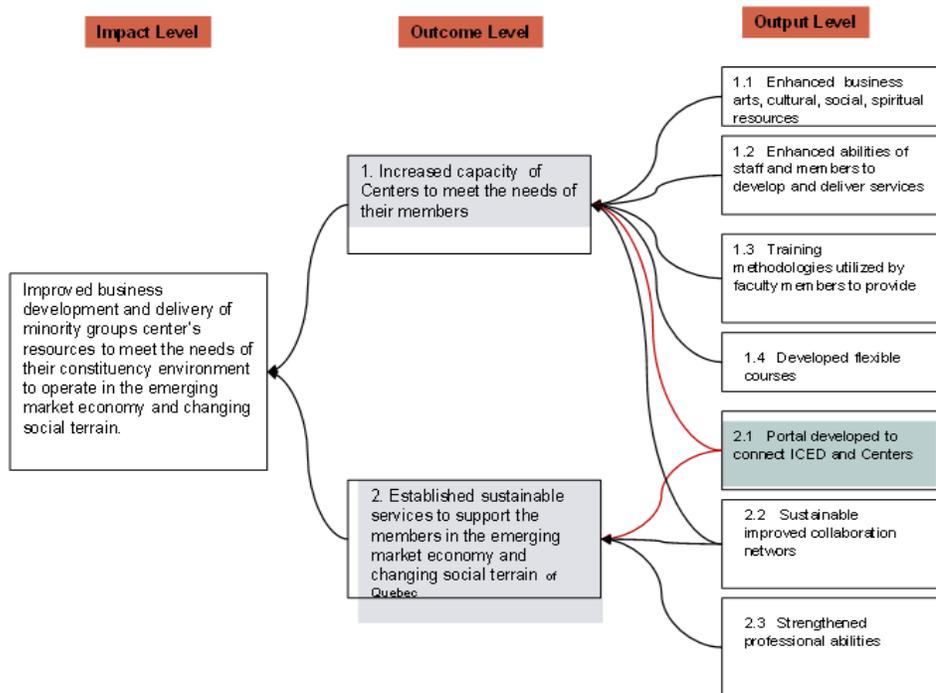
The establishment of the communication network centers is expected to produce two sets/levels of outputs. These outputs are inputs to the organization and community sub-systems (English speaking Black communities and organizations) of the landscape. It is hoped that the proposed network system of which ICED is the central system will:

1. Provide and maintain mechanisms (communication and information technologies), protocols and procedures aimed at increasing the capacity of each communication Center (organization) to meet the information and communication needs of its constituents
2. Establish sustained services to support the decision searches of the centers and their members in the emerging market economy and the changing and political landscape of Quebec.

We postulate that these two system outputs are essential to providing a desired level of communication and information sharing to support the strategies and supply the ingenuity needed for continuous improvements in community fitness. That is, it is believed that the use of the communication and information technologies will increase the capacity and capability of members of the groups to adapt more efficiently and effectively to changes in the fitness landscape of Montreal and Quebec; and take advantage of opportunities available. Figure 3 illustrates the impact-outcome-output expectations. The outcomes are the expected deliverables at the organizational level generated by the two levels of the network outputs. This must be understood in the context of this paper to be a desired ideal structuring of the mechanisms and institutional arrangements that inform the belief system described in diagram 1 above. This outcome-output –chain is interactive and is subject to revisions in terms of the feedbacks from the network system. The desired outcomes are:

1. Enhanced management and business, arts and cultural, and spiritual capacities and resources,
2. Enhanced abilities of staff and members to develop and deliver services,
3. Access to training methodologies and learning programs developed by colleges and institutions of higher learning
4. Development of flexible training facilities,
5. Development of Portal and common database to connect ICED and centers,
6. Sustainable improved collaboration between network organizations: increased communication and ingenuity supply capacity), and
7. Strengthened professional abilities: increase entrepreneurial ingenuity and innovative capabilities.

Figure 3 provides a graphical presentation of the non-linear association of system outputs with organization and member outcomes as a chain of events. The first four outcomes are a result of system output level 1 and the last three (5, 6 and 7) are a result of system output level 2 (Note that outcome 5, ICED portal development, is projected to be central to the implementation and development of the network system as a whole.



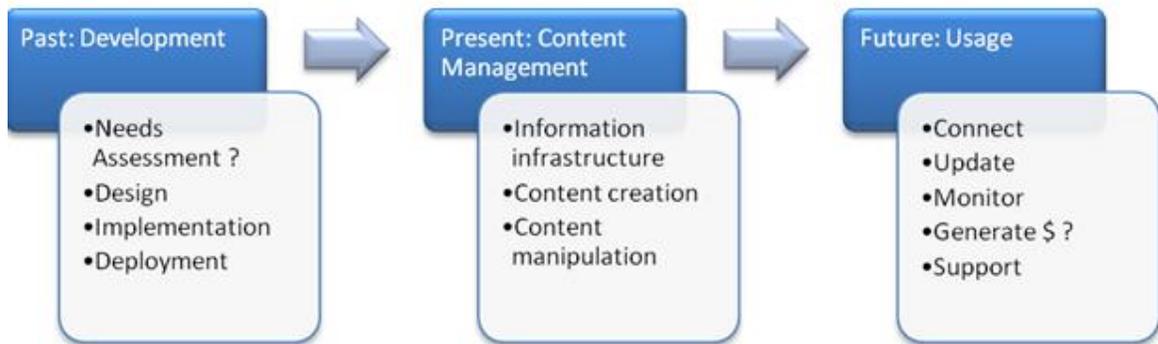
**Figure 3: output and outcome chain**

The learning aspects of the communication network will involve discussions at the communication centers on social issues; monitoring the progress and displaying outcomes and best solutions; on-line and face-to-face workshops. There will be a real-time feedback loop mechanism created and built into the central node site (common database accessible by each Center). All programs and strategies will be subject to a results based management process to determine their efficacy. Data collected across all centers can be used to develop a general well-being index for the community. This has been partially tested using an ICED Survey instrument during the early phases of the development of the network (ICED, 2010). Specific Center-based information at the portals and websites of key communication center is used to update knowledge in the larger community belief space about the target groups and the community they serve: art, culture and identity defining events, their histories, social, economic, and political positioning and contributions to the settlement and development of the landscapes of Quebec and Canada as inclusive, culturally diverse, and democratic societies. There are three time related phases to the development and construction of the proposed system networks centers.

1. The first phase is the development stage requiring a review of the center's mission and history of successes and failures. Online Reports will be updated periodically.
2. The second phase relates to development of information and data collection structures, content creation and validation, content management. The Global Reporting Initiative system (GRI) will be used as guidelines for reporting and making standard organization disclosures; and keeping track of local fitness indicators.
3. The third phase is the usage stage: sustainability of activities and connections with Centers, monitoring the changes in the GRI reporting systems and social indices at the Center levels, and measuring their overall impact on the social wellbeing of the kinship group and society.

A built in real time feedback mechanism will enable a continuous monitoring and updating of the effectiveness of the communication of ICED with the centers, and between centers. This facilitates

the creation and sustainability of learning resources, and provides continuous access to new knowledge stored at the common database. It helps to reduce the ingenuity gap at the local organization and leadership levels. A picture of this process over the three time phases is presented below in Figure 4 as shown below:



**Figure 4: Three Construction Time Phases for the Information and Communication Network System**

### ***INITIAL APPLICATIONS AND TEST SETS***

The learning strategies and simulated guidelines derived from the cultural change model we have described earlier in this paper are being used to test the outcomes of the plan of action of a Forum of twelve Black organizations in the English-Speaking Black Communities of Montreal. A Survey of 10 Black leaders in key English speaking Black organizations was conducted by ICED in May 2013 as part of a needs assessment study. Nine (9) out of ten (10) of these leaders indicated the need for the following structure and service:

“Formal creation of community based networks of communication and information sharing as strategies for advancing their group’s image, advocacy, and initiatives to assist individuals of the group increase their capacities and capabilities for taking innovative action to overcome the social political and economic barriers that inhibit their movement to higher life levels”.

This created the basis for the design and development of the network described above as an “output-outcome chain” under item number 5 and represented in Diagram 3 as outcome 2.1 (ICED Survey, David O’ Brien Center, JMSB, 2010). Diagram 2 above shows possible linkages with some key centers in the Black Community at the time of the survey. The following organizations are participants in the network that is currently under construction: the Quebec Board of black Educators (QBBE), the Black Studies Center (BSC), the Black Community Resource Center (BCRC), the Black Theatre Workshop (BTW). The Pan-Black Events Website of an Alliance of Black organizations in Montreal and supported by the Black Community Forum of Montreal. These organizations are also member organizations of a larger group of twelve English speaking Black Organizations, the Black Community Forum, that have come together for the purpose of reducing fragmentation caused by Black immigration from many different countries. Fragmentation inhibits effective communication, a problem associated with the multiplicity of closed sub-cultures based on country of origin. Therefore, the purpose of the Black Community Forum is an attempt by Black leaders to develop a process, which will identify a long-term development plan for the Black community as a collective; and to ensure that this planning process is a cooperative effort within the Black community. To further these objectives, the Forum has created an administrative structure (The Secretariat of the Black Forum) to support the planning process and provide a network of inter-organizational connections that build and strengthen existing relationships (Black Community Forum, 2015: BSC Portal 2017).

The focus of the Forum operations is on improvement in communication and information sharing as a strategy for strengthening the vitality and negotiating strength of the Black community. At a meeting of the Black Community Forum, June 16 2016, attended by 20 community organizations and 50 individuals, two important propositions were approved by the Black Community Forum: one for the support by the Forum of “The Pan Black/PanArique Events Manifesto and Website administered by the Black History Month Round Table. The second relates to the formal recognition and support by the Black Community Forum of a joint program on the development of a Community Archives and Communication Technology network as collaboration between four organizations, the BSC, BCRC, QBBE, and ICED (Bscportal, 2016).

### ***BUILDING THE NETWORK CENTERS AND ORGANIZATION MEMBERSHIP DATABASE***

The ICED plays a central role in the discussions relating to developing this community communication and information technology based strategy. The Institute is part of the JMSB faculty initiative (University of Concordia) to facilitate the development of social and community entrepreneurship to assist in improving the fit of the Black English speaking and other minority and disadvantaged communities in Quebec society. The mission of ICED “ is to provide opportunities for members of Aboriginal, Black, ethnic and immigrant communities to acquire the knowledge and skills necessary to improve their situation as well as the economic and social conditions in their communities. ICED achieves its mission by engaging key representatives and organizations within these communities, conducting research and providing managerial tools and training that will facilitate social and economic development.” As a result of its association with the Black community of Montreal (teaching, research and community development) ICED has taken concrete action to broaden the research data and enrich the information available for informing community leaders and exemplars in the Black, indigenous and other minority communities in Quebec. To assist the development of ingenuity capacity in these networks and community organizations, ICED has entered into a research and publishing partnership with the Informing Science Institute (INSITE), an international association for the multidisciplinary study of informing systems. As a partner, it is responsible for publishing an International Journal of Community Development and Management Studies (IJCDMS). The Journal invites scholars and practitioners, worldwide, to examine social and economic development in diverse socio-economic environments. The aim is to help readers (leaders, community organizers, managers, policy makers) in the Black and other communities to develop and promote an understanding of the role played by “under the radar” ethnic community organizations; and the impact of culture, ethnicity and class on the individual, the group on community and socio-economic development: an approximation for fitness.

### ***NETWORK CONNECTION AND SHARING OF INFORMATION***

There is no direct data sharing from a common data base or archival system in the Black community of Montreal or Quebec as yet. The sharing of information is done on an informal basis between member organizations. What data the agencies want to submit to a common data base is still being discussed. Also, a pilot study for the archiving of community organization files is being conducted by the Black Studies Center in collaboration with the Quebec Board of Black Educators and the BCRC. A pan-Black cultural events network is now in place under the management of the Black History Month Round Table. ICED Portal is being redesign to create a common and open archive system and database accessible to the four key participants in the network. Also, negotiations are taking place with Libraries Concordia to establish an open archive system. As part of the building of the network, portals have been created at the Black Studies Center, the Quebec Board of Black Educators, the BCRC and the BTW. These organizations have acquired the capacity and trained personnel to manage their private physical and digitized information. The BCRC, BSC, BTW and QBBE have personnel whose function is to manage the digitized communication and information systems that they have put in place. Moreover, there is a joint archival agreement between BSC, QBBE, BCRC and BTW. In addition, several of these organizations have come together as part of an Alliance of Black

organization to create a single website for the purpose of promoting and informing the larger community of Montreal and Canada about the socio-political, arts and cultural events that define the identities and inform on the histories of the Black and African communities of Quebec. The name of the website is “Pan Black Events.” It is centrally managed by the Black History Month Round Table on behalf of an alliance of organizations and the Black Community Forum (<http://panblackevents.com>). The manifesto of the alliance reads as follows:

“The coalition of individuals and organizations that came together to develop this manifesto places its focus on events that define us and are expressions of that which is common to us and make us valuable to society as a collective. The manifesto is an invitation to all cultural communities of Montreal, Quebec and Canada to participate in and support these events as activities that advance the development of the new diversity that defines Montreal and Canada as a whole”. The events listed in this manifesto of community organizations are core events that collectively give a broadly defined conceptualization of Montreal based Pan-Black cultural activities.

### ***CONTENT CREATION***

In general, content is determined by independent decisions of the network organizations in response to the emerging patterns observed from outcomes of the connections and interactions of the agents in the network and the fitness landscape. At the current time the organizations are not linked online as a network in the sense visualized for the planned network system. As a result, content creation is not centrally controlled and automatically stored in a central database. However, online communication has increased significantly between agent organizations as a result of an increase in the number of workshops and attendance at these workshops. The Pan-Black Events portal and the Black Studies Center Portal are playing a role in the centralization the control of the promotion and distribution of arts, cultural and social information, Through the media of workshops and meetings organized by the Secretariat of the Black Community Forum joint representations are now made on a number of development issues to the various government agencies: Ministry of Education, Ministry of Heritage, the Commissioner of Official Languages (The Future of Linguistic Duality : A Response to the Conference Theme November 30 2017), City of Montreal borough councils and the City of Montreal Executive Council (The Road Ahead). Complete documentation and the communication between the members of the Black Community Forum and the Secretariat is stored centrally at the Black Studies Center archives and the BCRC (administrative arm of the Secretariat of the Black Community Forum). These are open data sources that are available to member organizations and the public. In addition, much more information is being posted by the individual organizations consistent with the concepts and principles suggested in the guidelines of GRI: Annual Reports, Program Reports; Town Hall Reports and Discussions; historical and cultural documents; videos of workshops and conferences. Semaji Newsletter, published by the BCRC in collaboration with the Black Studies Center, is an online digitized newsletter posted on the BSC portal and the BCRC Website. As a result of this network center plan, the newsletter has been expanded from four issues per year to eight issues to cover the expanded network communication and information needs. It addresses a wide range of socio-political issues relating to the English Speaking Black organizations and about the challenges facing Black community development. The general public has access to this new and updated information on the portals and websites of the of the following organizations in the network: BSC, <http://bscportal.wordpress.com> ; Quebec Board of Black Educators: <http://www.qbbe.ca>; Black Community Resource Center <http://brcmontreal.com/> ; and the Pan Black Events site administered by Black History Month Round Table on behalf of the alliance of Black organizations and the Black History Month Round Table, <http://panblackevents.com/about/>.

### ***SNAPSHOT OF CONTENT OF SOCIAL AND CULTURAL ACTIVITIES***

The following are Pan-Black culture identifying events promoted and displayed by the network of “under the radar” ethnic, arts, cultural, and Black community organizations in Montreal.

- Black History Month and International Day Events
- Black Theatre Workshop Vision celebration opens Black History Month in Montreal, third week of January annually. It presents the Martin Luther King Jr Life Time Achievement Award and the Dr. Clarence Bayne Community Award for exceptional achievements in the arts, culture and community development.
- Black History Month School Tour of BTW: Theatre performances tour schools every February.
- Black History Month programs of The Black History Month Round Table and Montreal Black History Month activities: events celebrated during the Month of February by associations and community-based organizations, institutions, Federal, provincial and municipal government agencies.
- March 21 International Day against Discrimination. Special Events by la Ligue des Noirs held at City Hall; and other community organized events.

### ***CONFERENCES, SEMINARS, AWARD GALAS***

1. Mathieu Da Costa Award Gala of La Ligue des Noirs honouring the lifetime work of Black social entrepreneurs and professionals in Quebec.
2. The Activities of the Black Writers Guild of Quebec: Kola magazine and other publications of Black writers in Canada and the Black diaspora.
3. A series of monthly readings and seminars; Editorials and publications specialized in Pan-Black cultural events.
4. Professional Black Theatre and Dance. This includes the Black Theatre Workshop season of Black plays and activities showcasing and promoting Black Canadian performing arts and artists.
5. The QBBE Da Costa-Costa Hall and Bana summer education programs and the BCRC in school programs.

### ***FESTIVALS***

- The Carifesta: Caribbean street carnival and associated events under its auspices and mandate. Montreal, July annually.
- The Reggae Festival of Montreal: annual Summer Festival at St Helen’s Island
- International Day Remembrance Week of the Trans-Atlantic Slave Trade and its Abolition: Activities of La Ligue des Noirs du Quebec at Saint-Armand, reception at City Hall. Two weeks celebrations in August of every year
- Montreal Black Film Festival of the Montreal International Black Film Festival-MIBF dedicated to promoting cinema, art and culture

### ***PROMOTION OF CARIBBEAN AND AFRICAN CULTURAL FESTIVALS***

- Jamaica Day
- Trinidad Day
- Nuit D’Afrique
- Haiti en Folie
- Vue D’Afrique

- The Promotion of the Kwanza Festival at the end of each year following on Christmas, projects of UNIA and the Union United Church of Montreal.

### ***EVENTS AND DOCUMENTS POSTED ON BLACK STUDIES CENTER PORTAL***

“The Black Studies Centre Portal publicizes, promotes events, and discourses; digitizes, archives, and dis-tributes materials, which in general present and define Pan-Black-Canadian Identities, with a particular focus on the English-Speaking Black Communities in Quebec.” It serves a coalition of organizations that support Pan-Black events that contribute to and enrich the Canadian diversity.

### ***ACTIVITIES AND PROGRAMS***

- Black Studies Center–ICED (Concordia) Information-Technology and Community Communication Network; and an Archival System which processes and preserves a collection of documents of the history of Blacks in Quebec and Canada.
- Sponsor and joint publisher of the BCRC Newsletter Semaji, (a Black digitized newsletter). Links to the Quebec Community Groups Network Daily updates on reports, government policies and information, events and activities pertinent to the culture and vitality of the English-speaking peoples and communities of Quebec.
- Stores and preserves data on histories of Black community organizations; articles, research papers, rare newspapers and journals; task force reports, reports of the Black Community Forum (Val Morin 1992 Forum and the June 16 2016 Forum; conferences and workshop documentations;
- Present displays at summer programs. Collaborations on social entrepreneurship programs. Presentation of research papers and briefs to government and other agencies and institutions. Dissemination of research information on Community development and small business start- ups.

## **NETWORK YOUTH SUMMER BUSINESS PROGRAMS**

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ICED and BSC prepared course materials for start-up business courses that are given at the Black Youth Summer School Program conducted by ICED and QBBE. The strategy is to expose Black youth to business as an alternative career, and to encourage Blacks to participate in providing jobs for themselves by increasing the number of Black owned business per 1000 Black population. The courses cater to small businesses that operate in the “cracks of the market”. Videos of these summer programs have been stored on Vimeo for future posting on the reconstructed ICED Portal; and on the QBBE and BSC web-site and portals.

## **SUMMARY OF STATUS OF SYSTEM USEFULNESS**

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The usefulness of the network will depend on how the outputs (its capacity to meet needs and sustainable services) of the network are perceived at the individual, the organizational and the community levels. In turn, this will depend on the significance of the connections and collaborations between the key organizations in the network. Hence, the creation of the Black Community Forum is based on the principle of “collaborative unity and existential responsibility”. These collaborations between mission bearing agencies create critical influencing/utility determining structures. By associating usefulness with the economic concept of utility, we can say that the usefulness of the network depends on the improvements in utility (an approximation for fitness). This is expected to be produced from the increased access to information and knowledge held by exemplar agents (social entrepreneurs) in neighboring sub-populations (i.e., experts, goal setters and innovators). It will require a holistic approach to community development supported by network centers that provide communication and information services at levels that improve and sustain the capacity of the organizations and the

community to adapt and evolve from generation to generation. In real terms, community practitioners need to increase and sustain the capacity of its sub-systems (sub-populations and organizations) to achieve and maintain the desired level of outcomes consistent with a higher fitness level for the English-speaking Black Communities. This must be tested with the help of information provided by a built-in feedback subsystem of the network. This will be possible when an automatically updating common data base is put in place. That is being designed and created by the ICED. It will also require the creation of additional content in order to obtain a more comprehensive analysis of the effectiveness of the relationships supported and sustained by the network system and its centers. The mechanisms described above are also important for monitoring and updating the knowledge and information system that informs the strategic decisions making and planning of the community organizations and their social entrepreneurs. For example, currently there is no automatic information feedback loop in the system. Also, there is no centralized data collection system for observing and measuring variables that approximate the wellbeing and changes in the wellbeing achieved by the members in the network system.

This data base has to be built into the planned network center(s) so that the essential social and economic variables can be gathered and stored for use by the network and future generations. There is no comprehensive measure of a fitness index for the Black Community in Montreal. In reality, such an index would indeed be impossible to construct at a point in the mapping of the surface of a fitness landscape as described in this paper. Theoretically speaking, there are many possible utility (wellbeing) producing outcomes that finding a precise optimum solution is virtually impractical. However, an approximation of fitness can be constructed using methods applied in the United Nations reports on human development. The Human Development Index (HDI) uses weighted averages of dimension indices such as, the life expectancy index, the education Index and the GDI index, which taken together with measures of inequality such as comparative data on income, employment and unemployment, poverty and etc. are considered reasonable approximations of fitness. At a significant cost, much of the data can be obtained from Statistics Canada census data, transformed into social indices and economic indices and made available as part of the common data base for the Network members. It is an objective of the ICED-BSC-BCRC Communication and Information network centers. It is our opinion that communication network centers will help to increase the capacity of the Black English-Speaking minorities for solving problems of social and economic exclusion; and for promoting sustainable development. The focus of the study is on the English speaking Black Community of Montreal, Quebec, Canada, but it also applies to other minority and new immigrant communities.

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## BIOGRAPHIES

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