

Improving Organizational Innovation  
Capability Through Effective Hiring  
and Retention—A literature Review  
Based Research

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## **ABSTRACT**

This thesis addresses a key problem that managers face when seeking to improve the innovative capability of a company: the hiring and retention of innovative individuals. Through literature review, a gap between the importance of effectively attracting, assessing, and retaining innovative employees and the lack of study in the field was identified. Then through literature review, methods and models are discussed to help companies to attract, evaluate, and retain innovative individuals. A literature review was first conducted on how an individual and teams contribute to and impact a company's innovative capability with a focus on how an individual contributes as they start their tenure at an organization. Then evaluation methods were reviewed to build a framework that helps management in the selection process of prospect employees with the goal to improve the organizational innovation capability. To evaluate an individual's innovative potential, evaluation methods such as the Discovery and Delivery Skills, the Kirton Adaption Innovation Inventory, and the Creative Personality Scale were reviewed and combined into a framework. An individual's innovative attributes were summarized for hiring managers to aid in the selection process. In addition, the framework proposes that individual evaluations be used in conjunction with additional evaluations that place the new individual within the correct job and team. Different methods, such as the Optimal Job Function Fit, Work Preference Inventory, Creative Problem-Solving Profile, Team Climate Inventory, and the Team Selection Inventory, were reviewed and discussed. Finally, to help a company start with a rich pool of highly innovative job candidates, the role of a company's image building and the mechanism to achieve an innovative company image building were also explored. A retention model was also discussed and suggested for companies to retain their innovative employees.

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## 1. INTRODUCTION

Innovation is key to the success of a company's ability to respond and adapt to the rapid pace of changing markets [1]. Companies largely report that innovation is critical to long term success and prosperity [2, 3]. Innovation capability is the ability of a company to innovate through defined innovative processes and strategies [4]. In other words, innovation capability is a systematic approach to innovation that is present throughout a company's strategies, processes, and supported by actions of employees. Success is not just hard work and diligence, innovation and creativity have become a requirement for companies to survive in the marketplace, as innovation holds the most promise for continued success [5]. Organizations should study innovation in an effort to learn new ways to generate and implement creative ideas into marketable products or services [6]. "Something new" seems to be what laypeople normally think when hearing the word innovation. However, simply stating innovation as "something new" is not a complete understanding. Instead, innovation should be defined with a complete definition that captures the whole scope of the concept of innovation. A complete definition of innovation is the development, implementation, and commercialization of ideas by individuals and institutions [7]. This definition involves the chain of innovation that starts with ideas that are developed by an individual or team into a product or service that is then distributed to the users who will derive benefit from the product. The above definition of innovation states that an individual or in most companies cases, a team of innovative individuals who are responsible for taking ideas from conception to commercialization. It's important for an organization to understand the factors and internal company interactions within the organization that influence innovation

capability. While most companies view innovation as a critical capacity that is required for future success, there has been limited practical execution of human resource policies, especially staffing policies that identify or support innovation [3]. Employees are a critical part of a company's innovation capability [8]. The skills and knowledge of a company's employees directly influence innovation capability of the organization [9, 10].

A central question about innovation that is of interest to an organization is, "What are the factors that increase innovation capability?" There are many factors that can influence innovation capability but one of the most common responses is that the employees of an organization are one of the largest factors [11]. Specifically, employees' skills, experiences, and knowledge which will contribute to innovation capability [12]. If this is true, then a follow-up question should be, "How can an organization's staffing processes positively influence its innovation capability?" While there is a large amount of research on improving the innovation capability of a company with already hired individuals or teams, there is a gap in research on how a company should find the right individuals to increase the company's innovation capability. Therefore, the goal of this thesis is to help fill the gap and propose a framework that helps companies to improve hiring and retention of employees to increase innovation capability.

## **2 LITERATURE REVIEW**

### **2.1 COMPANY INNOVATION CAPABILITY**

Innovation has been defined in literature as the development, implementation, and commercialization of creative ideas [7, 13, 14]. Innovation capability is crucial to a company's success [15, 16]. Innovation capabilities should be well understood by

managers since this capability will impact any companies' capacity to develop and deliver new products or services to the marketplace. Companies can increase their competitive advantage by learning how to manage innovation capabilities [15, 16].

A capability can be understood as the way companies adapt and respond to change [16-18]. A capability is comprised of the processes and strategies within a company that helps the organization handle the ever-changing landscape of a marketplace [4]. Innovation capability can be understood from this capability-based perspective; it is the organization's process and strategies that support innovation [4]. So, it follows that improvements in processes and strategies that support innovations will result in an increase in an organization's innovation capability. This is not a simple endeavor due to innovation being a complex entity [11]. The understanding of innovation capability requires a consideration of the complex interactions between the current state of a company, its marketplace, and the influence on that state of numerous interactions among individuals, teams, and organizations [6, 11, 19, 20]. Gaining a correct understanding of innovation capacity is not easy but very important due to its impact on the organization's longevity [16]. Without innovation, a company's long-term success is at risk [2, 3]. A company should be actively pursuing improvements to processes and strategies that support innovation capability.

### **2.1.1 Organizational Capabilities**

Amit and Schoemaker define organization capabilities as "the ability to develop, exchange, and carry information through the organization's human capital" [21]. Authors have argued that the context must be understood when examining capabilities [22, 23] since the capabilities need to be relevant to the company. Organizational capability is a

company's ability to deploy company resources into beneficial outcomes [21]. Another view of capabilities is Richardson's definition that capability is an organization's knowledge, skills, and experiences [12]. Capabilities have been defined as absorptive capacities that influence the way information is assimilated and used [24]. The absorption of information can be defined as a capability that can "refer to the organizational processes which bundle strategic knowledge resources into unique combinations and constitute superior performance themselves" [9, 25]. Capabilities have also been associated with routines [9, 26-29]. Ketata et al. suggest that capacities are developed based on the knowledge that a firm possesses and how an organization uses new knowledge to modify existing routines [9]. Competitive advantage comes from the utilization of resources within an organization [25]. Capabilities and knowledge have effects on an organization's competitive advantage [24, 30]. It is critical that organizations are able to find, assimilate, and use knowledge found externally to the firm [9]. Dynamic capabilities have an effect on organizational evolutionary changes, influencing the entire organization [16, 17]. Resources, processes, and values are the three additional factors that can influence organizational capabilities [31]. Values are the one important factor discussed by Christenson [31] playing a critical role in the approach organizations practice to handle change [32]. Values are the guiding principles or beliefs that direct the priorities of an organization [31]. Values are not to be confused with processes, which are the methods of operation within and organization. Processes are how resources are utilized and transformed within and organization [31]. Organizational values can come from a wide range of source and have a huge influence on organizations capabilities, including innovation capability. The above definitions have a common

theme, capabilities in a company allow beneficial outcomes through the combination and deployment of the company's knowledge, strategy, values, and processes into a beneficial direction that causes market gains for the organization. It is notable that organizations develop capabilities based on the knowledge contained within the organization. This leads to an understanding that knowledge and skill are a key factor of capabilities in a company.

### **2.1.2 Innovation Capability**

With the organizational capability discussed, further refinement is needed to highlight the factors that contribute to innovation capability of a company. Fully understanding innovation capability is necessary to allow a company to react to changing markets, especially in highly competitive markets. Literature has suggested that innovation capabilities should be thought of as a “continuous and deliberate learning process” [9, 33]. Innovation capacity is linked to a firm's current knowledge base and its ability to absorb and exploit new knowledge [9]. Innovation capabilities are likely to come from environments that provide generous access to knowledge or external non-firm resources [9]. From this, a company can see that knowledge processes are critical to company innovation capabilities. Process innovation capability has been defined as “firms ability to acquire, assimilate, transform, and exploit technically related resources, procedures, and knowledge for process innovation purposed” by Frishammar et al. [16], a definition that furthers the idea that innovation capability is based on the ability to absorb [16] and use knowledge in the routines applied to new product and process development [9]. The greater the number of individuals in a company, the greater the innovation capability within the company [34]. Innovation capability is related to the abilities of a firm to act

on existing knowledge and absorb new knowledge from both internal and external sources. Having stronger relationships with customers and suppliers will positively impact innovation capabilities [35], especially when dealing with open innovation [36]. This continues the understanding that knowledge is a crucial factor in capabilities, especially innovation capability. Additionally, human resources are individuals who contain organizational knowledge. As such, they are critical to innovation capability. Values are critical to anything that happens at an organization because they influence the actions and decisions or lack of action and decisions of individuals within groups and the organization [31]. Company values will impact innovation capability and its support within an organization. Christensen et al. describe something very similar to values when discussing a company's philosophies and the impact those philosophies have on a company's innovation [37]. Christensen et al. suggest that a company should have four philosophies to influence company innovation. The four philosophies mentioned by Christensen et al. are the following: individuals in a company should believe that innovation is their job regardless of title, that disruptive innovation is expected, innovation will happen with small organized teams, and it's good to take "smart risks" during innovation [37]. Further examples of values that can support innovation capability in literature are the following: Show that innovation is valued and expected [37-39], allowing and encouraging failure [32, 37, 38], risk-taking [32, 37], fighting negativity [38], and experimenting [32]. Values show what a company can and cannot do and should be the starting point used by a manager to develop strategic directions [31]. A manager should also be aware that strategic direction and values are tightly linked, with one feeding into the other. Values that support innovation are important to an innovative

company and will result in an increase in innovation capability. Therefore, a company should make innovation part of its values and use that value to drive a strategy that is supportive of innovation. A manager should make value for innovation part of their work goals and instill those values within their teams. Managers should hold innovative values as a critical component in all strategic planning.

### **2.1.3 Resources and Innovation**

One of the most visible parts of an organization is the resources that the company possesses. Resources are the stocks of available factors that are owned or controlled by an organization [21]. Resource may be financial assets, people within the company, physical goods, intellectual property, and knowledge. Resources are always in limited supply within any company, with many priorities competing for their use. Resources are the tools or things that allow an organization to function as required to conduct business effectively [31]. Organizational capabilities come from the knowledgeable use of resources by the human capital [21]. Two organizations may create very different outputs from the same resources, since each organization may have different values and processes [31]. Resources are critical to creativity since improper allocation can reduce or destroy creativity [39]. Sufficient monetary resources are needed for a project or idea to become a product, and the lack of funds or improper allocation can inhibit creativity needed for new product design, causing reduced performance or failure [39]. Time is also a resource, more commonly referred to as schedule. The schedule can be used to place needed pressures on groups, but caution is required since proper exploration time is required when dealing with creative endeavors [39]. Time should be thought of as any other resource that needs to be properly managed since people should be given time for



innovation [37]. The lack of correct technology or competencies within a company will inhibit the ability to function and innovate [10]. Lack of proper equipment can suppress creativity in an organization [40]. A company needs to provide the resources required during development not to restrict innovation. Dominate designs are the expected solution to problems in the market space [41]. A manager should not deploy resources to redevelop dominate designs since this would starve other innovation projects of the limited resources present in all companies. A company needs to be aware of the limited nature of resources, deploying resources based on strategic goals that support innovation capabilities.

People are a critical resource, a resource that is required to improve the innovation capability of an organization [8, 37]. Persistence of current innovation indicates a firm's ability to integrate new and current knowledge and is a good predictor of future innovation [42]. The core knowledge of an organization has a great influence and impact on all types of innovation [10]. The ability of an internal resource to absorb new knowledge is aided by investing in knowledge sources, which will increase knowledge absorptive within an organization [9]. The ability to apply individuals' knowledge in a creative manner directed towards innovation is a skill that is missing in many organizations [43]. People play a critical role as a resource in the innovation of a company. As such, the resource should be invested in a similar manner, just like any other company asset. Investment in human resources is made through training of the current employee pool in a company. There are organizational benefits from investing in employees through training [9]. Companies can increase the creative skills of their employees by training, increasing the employee's ability to handle new problems [44].

Lack of training can inhibit creativity in an organization [40]. A manager should be aware of the benefits provided by supporting continued learning and training opportunities. Understanding the impact resources have within a company will improve understanding of the influence they have on innovation.

#### **2.1.4 Improving Innovation Capability**

Improving innovation capability is critical to an organization's future success and long-term survival. Without innovation capability, a company cannot produce the needed innovations that will be critical to the company's success. A few frameworks for innovation improvement have been proposed in literature.

Christensen et al. in *The Innovators DNA* proposed a framework for individuals and companies to improve innovation capability [37]. The framework proposes that are five discovery skills that a highly innovative individual will have in greater supply when compared to an individual with lower innovative ability [37]. The five skills are the following: questioning, observing, networking, experimenting, and associating [37]. Each of the skills is helpful in understanding their influence on individuals. Each of the skills will be discussed one by one to allow them to be understood in greater detail. Questioning is an individual's ability to ask questions that challenge conventional thinking about a problem; in other words, to ask why a certain problem must be solved in a conventional manner [37]. Observing is the individual's ability to watch their surroundings and to learn from those observations [37]. Networking is an individual's ability to interact with peers across several groups, at times, with groups that are not related to the individual's industry [37]. Experimenting is an individual's ability to test new ideas and experiences [37]. The above four abilities combine into the discovery skill of associating, which is

the combination of seemingly unconnected things into a new thing that is more than the sum of the parts. According to the framework, the associative skill is the primary one that will drive new innovative business endeavors [37]. The book continues with a framework with three attributes within innovative teams and organizations. The three attributes are people, processes, and philosophies [37]. There must be management focus on innovation, with many of the most innovative companies having leaders who took a personal interest in innovation. But Christensen et al. still note that people at all levels should be invested in the innovative process [37]. A company should have processes in place that support innovation within an organization, specifically processes that support individual discovery skills [37]. One of the processes that Christensen et al. suggest is that individual employee's creative and innovative skills should be evaluated and the results considered during the hiring process and employee reviews [37]. The philosophies of a company are critical to innovation, according to Christensen et al. [37]. The philosophies of a company should be supportive of innovation, Christensen et al. showed that a company would have higher innovation capability if it has support for innovation within cooperate identity through four philosophies [37]. The four philosophies were mentioned briefly earlier in this thesis: Innovation is everyone's job, expect disruptive innovation, small well organized teams, take smart risks [37]. The five individual innovative skills and the three company skills proposed in *The Innovators DNA* framework will increase the innovation capability of an organization.

Another framework proposed in literature is the innovation value chain. The innovation value chain proposes that innovative ideas need to progress from generation, through conversion, and then to diffusion [45]. Ideas first need to be generated by either a single

individual or by a team. Once ideas are generated, there is a need for the generated ideas to be paired down, discarding ideas that are not feasible or practical to move forward and selecting beneficial ideas to be further developed. Once fully developed, the output of the idea can be spread internally through an organization, externally to customers, and to the marketplace [45]. Another framework that is like the innovative value chain is the Creative Problem-Solving Styles [46]. The Creative Problem-Solving Styles framework states that ideas need to progress through eight steps on the path to implementation. The eight steps are: Problem Finding, Fact Finding, Problem Definition, Idea Finding, Evaluation and Selection of ideas, plan, gaining acceptance for the plan, and taking action on the plan [46]. The eight steps are like the innovation value chain. There are close similarities to the first four steps and idea generation of the innovative value chain. Evaluation selection is like conversion in the innovation value chain and the remaining steps comparable to diffusion. If a company struggles with idea generation, there are several suggestions that can help the company to improve. Distributors, suppliers, and customers can provide external ideas and comments that will help improve innovation in sustaining products and new products through merged efforts [31, 38, 45, 47]. From the frameworks discussed it becomes clear that for innovation to happen there needs to be process within a company that allows ideas to be generated, selected, and implemented. Firms must develop the ability to acquire, assimilate, transform, and exploit new knowledge and learning into new capabilities, including innovation capability [24]. Innovation capabilities can be improved by increasing absorptive knowledge capacity and the breadth and depth of knowledge that is sourced [9]. A firm should exploit both the internal absorption of knowledge and the integration of external knowledge to develop

innovation capabilities within an organization [9]. A company must develop the ability to find new knowledge or competencies, then assimilating appropriate knowledge into understanding that will be transformed into a product, process, or service that can be exploited to benefit the organization [24].

Capabilities in an organization have been discussed previously in this thesis. Literature supports the concept that values, strategies, and policies that support innovation will improve innovation capabilities within a company [9, 16, 32, 33, 38, 39]. Additionally, linkages to external factors have an influence on a firm's innovation capability, especially linkages to customers and suppliers [35]. Innovation can be viewed as a strategic resource that can increase organizational effectiveness and competition in the market [1].

Therefore, a company looking to improve innovation capabilities should review their values, strategies, and policies to see if those are supportive of innovation.

### **2.1.5 Human factors in Innovation Capabilities**

If knowledge and people are key factors in innovation capabilities, then organizations should develop methods to select and place individuals into open positions who possess the factors of innovation. Christensen et al. place people as one of the three components critical to an innovative company or team [37]. As such, the impact of people should not be overlooked by a manager of innovation. This leads a manager to see the need for a team or company to be filled with skilled employees who can increase innovation capability. The book *The Innovators DNA* states that people are vital to the innovation capability in an organization and that companies should evaluate potential individuals for their innovative and creative skills [37]. Hunter et al. state that it is vital for companies to have a strategy to recruit, select, and retain innovation individuals [11]. Arad, Hanson,

and Schneider state that research is needed to find the best practices of selecting employees to improve the innovation capacity of an organization [48]. A manager concerned with innovation should understand the hiring selection process and which employees should be promoted [48]. Human Resources can include recruitment, selection, training, and rewards [48]. Innovation is not a simple concept, and as such, innovation needs different individuals with differing skills [11] who will play different roles for differing types or stages of innovation [5]. Newly hired individuals can have a positive impact on innovation capacity in a firm if they are properly integrated into the existing employee resources [49, 50]. External resources may be considered, but there is a concern with the protection of information since the outsourcing of research and development can cause vital information to be leaked to rival firms [51]. This possibility of leakage creates a case for keeping some or all the critical research and development in-house necessitating the hiring of new employees as a firm grows.

Recruiting creative talent is a critical first step in improving the innovation capability of an organization [11]. The processes of adding human capital to a firm, especially how to add innovative individuals are often overlooked during the hiring process. Organizations develop a hiring process designed to increase innovation capacity within departments, groups, and the whole organization.

## **2.2 CREATIVITY AND INNOVATION**

### **2.2.1 The link between creativity and innovation**

Innovation has been defined by literature as the development, implementation, and commercialization of creative ideas [7, 13]. Creativity and creative ideas are a critical

factor that is necessary to develop the environment or conditions required for innovation to occur within a company [11, 52]. Creativity and innovation are linked but not completely the same concept and can't be used interchangeably. Creativity and creative ideas are necessary to develop the organizational environment that is required for innovation to occur within a firm [11, 52, 53]. In other words, using the output of creative ideas to develop a commercialized product or service. Studies have shown that individual creativity can impact organizational creativity [54], increasing overall organizational innovation capability [53]. Creativity is a factor to be monitored within an organization since creativity can contribute to innovation capability [11] and be a predictor of organizational innovation capability [44, 55]. A manager of innovation should have the understanding that creativity is critical to the complete understanding of innovation, but creativity is not the only factor that influences a person or a company's innovative performance.

Creativity individuals within a company can create a positive impact on a company's overall creativity [53, 54]. Creativity and innovation are linked but are not always the same concept and can't necessarily be used interchangeably. Creativity should not be used interchangeably with innovation, but it's useful to understand that creativity is a key component in innovation, and the creative process is part of the innovative process. A researcher should be careful to understand the distinction due to some literature using creativity as a substitute for innovation.

It has been proposed that creativity is not a single trait within an individual but instead, a complex interaction of personality traits, cognitive, and social influences [56]. Unique experiences can bolster the creativity of an individual, even experiences that seem

unrelated to the specific field in which creativity is desired [37]. Therefore, there is a need for a variety of individuals with a variety of experiences to be present on a team so that the overall team creativity can be improved through the interaction of the individual's unique traits.

Creativity can be a predictor of innovation occurring within a group of individuals, again exemplifying creativity as an indicator of innovation [44]. Innovation requires creativity, but the reciprocal is not always true; creativity does not necessarily lead to innovation unless there is a supportive company environment [11]. Creativity is one of the major capabilities an organization must possess to encourage innovation, a needed component, an indication that innovation might occur [11]. Studies have shown that high levels of organizational creativity will create higher levels of innovation performance [55] .

### **2.2.2 Components of Creativity**

The three main components that make up creativity: expertise/problem-solving abilities, creative-thinking skills, and motivation [5, 39, 57]. If all three are working in concert, it will create the best environment for creativity [5]. Additionally, individual skills and abilities combine to influence creativity and innovation within a team, company, and industry [52]. Literature has shown that one gender is not more creative than another, proving that gender is not an indicator of creative performance [58, 59].

Expertise is the domain-specific knowledge that an individual possesses, which contributes to work functions [11, 39]. Knowledge is required for creativity to occur within an organization [52], without relevant knowledge or skills an individual cannot bring ideas to fruition [11].



Creative thinking is the mental ability an individual uses to work through problems or situations [39]. Creativity thinking is broken into two sub-components, divergent and convergent thinking. Divergent thinking is the ability to think with varied and new ideas [60]. Convergent thinking is the process by which an individual uses existing knowledge in a known configuration to develop ideas and solutions [60]. Both divergent and convergent thinking abilities have been correlated to an individual's ability to be creative both individually and within a team [46, 52, 60]. Divergent and convergent thinking work in parallel to both generate and then implement new ideas [57, 60]. For example, the creative process could involve an individual thinking about a problem by exploring possible ideas that might provide a solution to a given problem pulling from unlikely sources, which is using divergent thinking. Once ideas have been generated through divergent thinking skills, it can be evaluated by the individual based on existing knowledge of the subject matter, which is then using convergent thinking skills. Once the individual has used both divergent and convergent thinking, the idea can be further refined and changed through the team's combined divergent and convergent thinking skills. Utilizing the team will allow the individual members to exploit their varied backgrounds, experience, and expertise [11]. Because of team interaction, final outputs of this process take on lives of their own evolving into something that cannot be traced to a single group member resulting in an output that is greater than the sum of its parts [11, 61, 62]. At times a team will iterate in the process multiple times with divergent and convergent thinking patterns being dominate before an idea is fully finalized. Iteration should be understood as a normal part of the creative discovery process of an idea. A manager can use an understanding of creative components to guide teams through the

process of creative discovery of an idea. Allowing both divergent and convergent thinking skills to be used by team members. A broader understanding of creativity will improve a manager's ability to lead a team through the process. The ability to foster creativity by management will create an environment that allows increases in innovation capability within an organization.

### **3.0 RESEARCH QUESTIONS**

#### **3.1 Hiring for Innovation**

Human resource management includes staffing, talent management, rewards, risk management & worker protection, employee & labor relations, strategy & planning, and equal employment opportunity [63]. Among those listed the following: proper management of staffing, strategy & planning, talent, and rewards will contribute the most to an organization's innovation capability [11, 63]. Strategy & planning and its correlation to innovation capability have been the focus of the research discussed previously in this thesis. Even though the importance of human resource development to an organization's innovation capability is obvious [1, 5, 15, 16, 24], as noted by Hunter et al. [11], little work has been done to aid a company in the hiring of individuals to improve innovation capabilities. The only work that is close was conducted by Hunter et al., through literature review, they evaluated seven standard hiring methods and made suggestions on which one(s) to could be used to test a potential employee's creativity related skills and attributes [21, 63]. Christensen et al. in *The innovators DNA* asked if a company evaluates for innovation and creativity skills when hiring a new employee to gauge if an organization is innovative [37]. But *The Innovators DNA* does not provide any method besides the Deliver and Discovery skills evaluation of an individual [37]. The

lack of a framework that a company or manager can follow using hiring to improve innovation capability is a gap in current research. This thesis will focus on staffing's contribution to a company's innovation capabilities, especially how to improve innovation capability through the hiring process.

Finding the right individuals is necessary for all job functions within an organization [64], and it adds value to an organization [65], especially when innovation is required since innovation capability is highly dependent on human capital [21]. Staffing's goal is to provide qualified individuals that will fill functional roles within an organization [63].

From an innovation capability perspective, staffing's challenge is finding the right individuals who will increase the innovation capability of an entire organization [11].

Staffing's first step is to understand job requirements, skills, and knowledge by means of job identification and analysis [63]. An appropriate job analysis will ensure those job requirements are satisfied and that a position will be filled by a quality candidate [63].

Current human resource management practices focus on the identification of an individual's past performance and an individual's characteristics and predictors to achieve job performance [63]. The ability to perform normal job functions is critical to an organization, but we are particularly interested in knowing "How can an organization correctly identify predictors in hiring with the main purpose of improving its innovation capability?"

Staffing requires that an organization effectively recruits quality individuals to fill job requirements that were found through job analysis [63]. The start of the recruitment process is to develop a job profile for a position that fits the requirements established in job analysis. Job profiles will aid in the selection of an individual from an applicant pool

by comparing candidates to the job requirements [63]. Effective recruiting requires an organization to know their industry and locations of qualified individuals, identify labor market conditions, have relationships with sources of recruits, and promote the company brand to attract employees [63]. Organizations receive applications from individuals in the whole labor force population, and individuals usually apply due to the employment image of the organization [63]. Attracting the right people to work at an organization is a required organizational function [64]. Palomares et al. found that individuals were willing to move organizations if the new organization valued a specific feature of importance to an individual [66]. This leads to the concept of employer branding. Employer brand is an organization's employment image based on the perception of current employees and external individuals [63, 65]. Organizations must spend time to establish and develop an employment brand that will attract qualified individuals to apply when jobs become available [63, 65]. Further, organizations should present a consistent, clear, and credible employer brand image to attract quality individuals effectively [67]. There is a gap in the literature concerning the methods to develop an employer brand that will attract individuals to increase organizational innovation capability. The overall factors that attract an employee to the company are a considerable topic that would be beyond the scope of this thesis. The question will be limited to company image building specifically concerning innovation to allow focusing and narrowing of the scope to something that can be handled within the context of a single thesis. A whole thesis could be devoted to answering just this question alone and might not be enough due to the depth and breadth of this single topic. Resources could come from both internal and external sources to the company. Internal individuals should already be proving a contribution to the innovation

capability of a company, so a hiring manager's focus should be on the external resources to the company. This thesis will focus on external resources to the company only since those will add most to the overall company innovation capability. From this the second question that needs to be directly addressed to improve human resource development for innovation purposes is “How can a company develop an image that will attract individuals who will contribute to an improvement in company innovation capability?”

Once the applications have been received, then the employee review process starts. By evaluating current employees, a firm can create a baseline to compare the results of prospective hires, predicting the job success of a possible individual [63]. Concurrent validity can be obtained from testing current employees to see if specific attributes or predictors exist and correlating to job performance, with a purpose to find the attributes that may lead to better outcomes [63]. Then potential employees are evaluated to see if they have the attributes deemed important to the job function. [63] A number of testing methods exist for such evaluation purpose, and they include [11, 67]:

1. Self-reporting – a popular evaluation method that can lead to reliable results if the assessments used are developed properly [11, 68, 69]. Self-reporting has limitations when dealing with perceptions of broad personality traits like complex concepts such as creative ability [11]. A study by Kaufman et al. found that creative assessments were not a good forecaster of creative performance [70].
2. Other reports – reports from someone other than the individual being rates. Normally peer or supervisor ratings of creative potential [11]. Directly asking about a topic may not provide reliable results due to possible bias [71], instead

focus can be placed on “specific behaviors, characteristics, skills or attributes” [11] that will indicate potential [11].

3. Biographical data – Based on the assumption that prior behavior is indicative of future behavior [72], biographical data can be a type of self-reporting that is based on answering questions about past behaviors or history of the participant [11]. The response can be scored to predict patterns or scaling of the abilities participant providing results that provide results similar to other inventories like personality evaluation [11]. Biographical data has been shown to be a reliable [73] and valid [74] method of evaluation.
4. Interviews – This is the most common method used by companies for selecting and hiring new employees. Interviews are used to determine the personality of the interviewee through a series of structured or unstructured questions performed by an individual or a panel of individuals. Interviews can be biased because it is difficult to assess hard to observe personality characteristics such as openness or experience in this format [11, 67].
5. Situational judgment tests – The goal is to evaluate the reactions or behaviors of a participant to a situation that will be scored by the facilitators based on defined evaluation criteria [11, 75]. It has been argued by researchers that situational judgment testing is actually an evaluation of broad knowledge [76]. Researchers have questioned the reliability of situational judgment testing due to the lack of coefficients offered in literature [11, 67].
6. Assessment centers or simulations – They are the most reliable [77-79] and valid of the methods while also being the most costly method of evaluation [11].

Hunter et al. reviewed the current literature offerings for the different assessment methods' ability to predict a potential employee's creativity [11]. Based on the literature review and recommended the methods best suited to assess a certain aspect of an individual's innovation capability. Assessment centers and situational judgment tests are recommended for assessing creative thinking skills [11]. Self-reporting is recommended for assessing the personality, intrinsic motivation, divergent thinking, cognitive ability, associational knowledge, and breadth of knowledge [11]. Hunter et al. discuss the need for future work into the area of identifying effective employee screening methods that will increase organizational innovation capabilities [11]. Therefore, our third research question is, "How to effectively evaluate job applicants with a goal of improving a company's innovation capability?"

In summary, to help improve the staffing process with a goal of hiring for innovation, our research questions are:

R1: How can an organization correctly identify predictors in hiring with the main purpose of improving its innovation capability?

R2: How can a company develop an image that will attract individuals who will contribute to an improvement in company innovation capability?

R3: How to effectively evaluate job applicants with a goal of improving a company's innovation capability?

## **3.2 TALENT MANAGEMENT – RETENTION**

Talent management includes employee orientation, development & training, career planning, and performance management [63]. Strategic talent management is the process

where advantageous jobs are recognized, and employees are developed to fill the roles needed to accomplish the jobs [63]. It is widely recognized as being advantageous to an organization [9, 63, 80-82] since it has been shown to better employee's skills, knowledge, behaviors, and attitudes [63, 82, 83] and thus improve productivity and profits [82]. Employee retention is one of the important outputs of talent management [84]. Talent management is critical in retaining knowledgeable and skilled employees at a company [85].

Retention is especially important for companies who desire innovation since these company's need knowledgeable workers to continue to develop innovation. If these individuals are lost, then there will be a loss of innovation since there is a direct link [86]. The retained knowledgeable employees are vital in the deployment of innovation within a company [87]. To keep innovation on track, a manager and company should prioritize retaining employees, especially those who have a track record of innovation.

Therefore, it is important to know, "What will positively impact a company's ability to retain innovative employees?"

A common thought for managers is, "I don't have to worry since I will just compensate the innovative employees, and they will stay." Literature has shown that compensation alone is not sufficient to retain employees, [88, 89]. This contrasts with the thinking of some managers, so there must be additional factors to consider to increase employee retention. Repeated increases to an employee's compensation have not been correlated to intrinsic motivation improvement since the increased pay will become expected compensation within a short time frame [90]. This concept logically makes sense since resources are always limited in any organization, so there will be a limit to the number of



increases that are possible for any position. Authors have recommended against using short term rewards as a performance improver, especially since it can negatively impact motivation [90]. The research question related to this section is, “What type of compensation and rewards policy will positively impact a company’s innovation capability?”

In summary, two research questions related to talent management and its impact on an organization’s innovation capability are developed, and they are:

R4: “What will positively impact a company’s ability to retain innovative employees?”

R5: “What type of compensation and rewards policy will positively impact a company’s innovation capability?”

### **3.3 RESEARCH METHOD**

Each question proposed earlier in this thesis will be addressed through literature. There has been a large amount of research individually on each of the topics contained in this thesis’s research questions, but there has not been much work done to thread the information together. This thesis method will bring the information together in a method that will allow a manager to understand what could be done to improve their innovation capability through the literature findings of the questions. Addressing the questions through literature will allow the answers to be valid and reliable since the questions will be answered from existing evaluation methods and research that has already been tested and proven. Testing the entire method would allow total predictive validity, but that is out of the scope of this thesis and will be handled in the recommendations for future work that could be a continuation of the work done in this thesis. Frameworks and models will

be developed as needed to aid the understanding of work done in this thesis by combining evaluation methods and research found through literature review.

## **4.0 RESEARCH FINDINGS**

### **4.1 First Research Question**

The first research question is, *“How can an organization correctly identify predictors in hiring with the main purpose of improving its innovation capability?”*

Individuals have an extensive range of personality attributes, personality types, skills, and specific knowledge that may contribute to company innovation. A detailed literature review has provided insight into individual attributes that contribute or are detrimental to individual innovation. Also, there are the team and organizational attributes that will be moderators to individual innovation and contribute to company innovation. The following discussion is a summary of the literature about individual, team, and company attributes that will contribute to innovation, with the results summarized in tables.

#### 4.1.1 Individual Attributes

Research has been done attempting to understand and categorize differing attributes of individuals and how they influence individual behavior. More specifically, research has been done to determine the interaction of personality and how these interactions influence a company. Myers and Briggs, one of the more popular personality tests [91], proposed that people fall into four categories with two possibilities per each category or a total of 8 attributes [92]. In the past, Myers Briggs has been used by scholars to compare individual's results to their ability to be creative and innovative. Individuals with higher Myers-Briggs scores towards intuition and perceiving are positively correlated to

individuals who were more innovative [93, 94]. Research also found that individuals with higher extroversion scores are positively correlated to more innovative individuals [93, 95]. A similar test to the Myers-Briggs that has been used to analyze personality is the Big five personality test that measures an individual with rankings that fall within one of the following categories: openness to new experiences, conscientiousness, extraversion, agreeableness, and neuroticism [96]. Rodrigues and Kwang looked at results from the big five personalities and found that innovators were extroverted and open to new experiences [97]. Hammond et al. also found that openness and innovation positively correlated through a meta-analysis of literature [98]. Researchers have linked personality traits and creativity [20, 98].

Grossman and King proposed that there are three main types of innovative personalities: eagles, otters, and unicorns [5]. The eagle personality is a tenacious innovator who tends towards innovation through improvements to existing products or services, using their strengths, excellent idea generators, desire to learn, excellent knowledge, and influence [5]. The Eagle personality wants to improve by rearranging, resize or improving a concept or problem that is given to them, causing them to be excellent adapters, extenders, and modifiers of existing products or services [5]. The otter personality is less concerned with projects that line up with the company's goals and visions; instead, otters want to work on an exciting project. Otters get motivated by doing things that are enjoyable and new [5]. Otters want innovation to line up with the world that they want to see from their own imaginations and experiences [5]. The unicorn is that of a person who can change the outlook of the market of a product or will create an entirely new market that did not exist. Unicorns are easier to spot due to the radical nature of their ideas [5].

The three personalities must possess similar attributes in other areas of their personality. Other researchers have found several traits that correlate with the innovative performance of individuals. Researchers have suggested that innovative individuals must have an internal drive and self-confidence [99]. Other researchers have found that innovative individuals are required to be ambitious, impulsive, flexibility, and emotional stability [57, 100, 101].

Innovation requires that an individual exhibits hard work, diligence, commitment, and persistence [57]. The commitment to innovation is a critical component of an innovative individual [102]. Research has shown that proactive action by driven individuals with a willingness to act will increase innovative outcomes [103, 104]. Innovative individuals need to start small and not be defeated when things do not happen correctly in their initial attempts [102]. The ability to not be defeated by failures while starting small defines experimentation. Experimentation is the ability to try again, and again looking for the reasons behind the outcomes of the experiments. Research has shown that innovators are active experimenters, continually exploring and testing to find innovation [37, 105].

Creativity and creative ideas are necessary to develop the organizational environment that is required for innovation to occur within a firm [11, 52, 53]. Three main components that makeup creativity, the components are expertise/problem-solving abilities, creative-thinking skills, and motivation [5, 39, 57]. Intrinsic and extrinsic motivation are included in the general broader definition of motivation [5, 39]. Motivation has a strong correlation to individual innovative performance [5, 39, 98, 99, 106, 107]. Creative thinking is another critical that allows innovation to occur [5, 39, 57]. Divergent thinking is an individual's ability to come up with new and varied ideas [60]. Convergent thinking

is an individual's ability to use conventional or standard solutions to address a given problem or issue [60]. Both divergent and convergent thinking abilities are required to find innovative solutions to problems [57, 60, 108]. Both have been correlated to an individual's ability to be creative or innovative, having a positive impact on a companies' innovative performance [46, 52, 60]. Through research that tested many individuals, divergent thinking is a good predictor of creative thinking abilities [60, 108, 109] and a predictor of an individual's ability to generate ideas [60]. Authors have suggested that bisociation thinking or the ability to find commonality in complex and uncommon systems is a required component of good creative thinking skills [5]. Associative thinking is the skill of linking ideas or concepts from different areas of expertise to develop new products or services [37, 105]. Bisociation and associative thinking are similar though processes were uncommon, and unrelated ideas or knowledge are utilized and combined to find new unique solutions. Individuals can improve their associative abilities by working with individuals from other fields, assembling different knowledge and ideas [37, 105]. Improving collaboration with individuals from different knowledge bases and backgrounds through "networking" leads to innovations that would not have been reached by staying within a group of limited diversity [37, 105]. Associative abilities that are gained by working with others outside of normal spheres would be less effective without good observational skills that notice opportunities to apply knowledge through an individual's associative thinking skills [37, 105]. Organizational knowledge has been discussed earlier in this thesis in detail, and organizational knowledge is developed from the knowledge of individual human resources contained within a company. Authors have shown that organizational knowledge is required for creativity to occur within an

organization [52]. Personal knowledge and expertise that a person possesses will add to the creative or innovative process [39]. So, it has been shown that knowledge or experience in a field is a required component of innovation within individuals [5, 20, 39, 57, 98, 110]. Knowledge must be applied to problems by asking the right questions or asking a question within a new context. The ability to question the status quo has been shown as an indication of innovation capability [37]. Asking the correct questions or asking questions in a different approach can lead to innovative solutions [37, 105]. Innovative solutions arise when asking what would or wouldn't happen if a specific plan or course of inquiry was pursued [37, 105]. Managers should look for individuals who are willing to challenge the status quo by asking the right, and at times, hard to answer questions.

When discussing individual attributes, it is valid to discern if there is a difference between specific genders and creativity or innovation. Research done by Burch et al. to validate the Team Selection Inventory found that there was not a significant difference between genders for innovation and vision [111]. This finding is similar to the analysis done by Baer et al. who performed a detailed analysis of a large number of studies that were concerned with gender influences on creative performance, this analysis of studies resulted in a conclusion that there was no significant advantage possessed in creativity by either gender [59]. So, gender is not an attribute that is an indicator of innovation. The individual skills are listed in Table 1.

Table 1 Individual Skills

|                         | <b>Skill</b>           | <b>Sub Skill</b>              | <b>References</b>               |
|-------------------------|------------------------|-------------------------------|---------------------------------|
| <b>Individual Skill</b> | Creative Thinking      | Creative Thinking – (Overall) | [5, 39, 57]                     |
|                         |                        | Divergent Thinking            | [46, 52, 57, 60, 108, 109, 112] |
|                         |                        | Convergent Thinking           | [46, 52, 57, 60, 108]           |
|                         |                        | Bisociation                   | [5]                             |
|                         | Associative Thinking   |                               | [37, 105]                       |
|                         | Questioning            |                               | [37, 105]                       |
|                         | Networking             |                               | [37, 105]                       |
|                         | Expertise or Knowledge |                               | [5, 20, 39, 57, 110]            |

A summary of individual attributes that lead to innovation is listed in Table 2.

Table 2 Individual Attributes

|                             | <b>Attribute</b>            | <b>Reference</b>              |
|-----------------------------|-----------------------------|-------------------------------|
| <b>Individual Attribute</b> | Motivation or drive         | [5, 39, 57, 98-103, 106, 107] |
|                             | Openness to new experiences | [97, 98]                      |
|                             | Hard Worker                 | [57]                          |

|  |                     |                   |
|--|---------------------|-------------------|
|  | Observation         | [37, 105]         |
|  | Commitment          | [57, 102]         |
|  | Persistence         | [57]              |
|  | Proactive           | [104]             |
|  | Experimenting       | [37, 105]         |
|  | Self-Confident      | [57, 99-101]      |
|  | Impulsive           | [57, 100, 101]    |
|  | Flexibility         | [5, 57, 100, 113] |
|  | Emotional Stability | [57, 100, 101]    |
|  | Ambition            | [57, 100, 101]    |

#### 4.1.2 Team and Company Attributes

Teams have specific attributes that can help or hurt innovation. A manager should understand the impacts that specific management attributes have on a team and individual. Both management and team attributes have impacts that ripple to organizational creative and innovative performance. The following is a discussion of team and management innovation attributes.

Effective teams require that a manager finds individuals that demonstrate personality traits that increase the team's ability to be innovative and creative [57]. A single individual can influence creativity or innovation within a team [82].

By creating a climate of shared values, a manager can develop an environment that encourages innovation and collaboration [57]. Managers should endeavor to implement policy and action that allows a team to share both values and ideas. Additionally,



Managers should build teams that have members who are open to expressing opinions and respectfully challenging the opinions of others. Opinions and challenges to opinions will result in a team where there is an increase in team learning, allowing ambiguities to diminish by making implicit knowledge more explicit [9]. Team trust has been shown to correlate with team collaboration and creativity [114]. Additionally, there is a correlation between team collaboration and creativity, where team trust is the moderator [114].

Inversely, overall effectiveness is reduced when team members are competing instead of collaborating [39], unnecessary internal competition or rivalries should be eliminated within a company [38]. Hiring Managers should know that internal competition can reduce overall innovation and strive to increase the overall collaboration of individuals. Additionally, teams can be limited by improper reward systems when coupled with the competition, leading to a reduction in creative ideas sharing due to increased competition to obtain rewards [11].

*Table 3 Team Attributes*

|                       | <b>Attributes</b>                                  | <b>Reference</b> |
|-----------------------|--|------------------|
| <b>Team Attribute</b> | Individuals are open to new ideas                  | [9, 57]          |
|                       | Trust between team individuals                     | [114]            |
|                       | Individuals able to collaborate                    | [9, 57, 114]     |
|                       | Individuals feel able to share ideas with the team | [19, 82]         |

|  |   |          |
|--|---|----------|
|  | Individuals are not competing<br>internally | [38, 39] |
|--|---|----------|

When hiring management level personnel, some additional attributes about a specific management style that encourages innovation need to be considered. Giving employees better work variability has also been shown to increase an individual's ability to come up with new ideas [20]. So, a manager should strive to keep employees from getting stagnant with a single focused work assignment. Giving an employee a more complex job, but one that can be accomplished will result in an increase in employee innovation [98].

Additionally, a manager should strive to become non-controlling in their leadership style since that has been shown to increase employee innovation [20]. In the same line of thought, employees are more innovative when they are given a degree of autonomy in the work direction and how tasks are accomplished [98]. There still needs to be a degree of control in the way of "role expectations." In other words, an employee must know the performance expectation from the manager for the employee's role [98].

A positive workplace climate will improve innovation within a company. Therefore, managers should strive to create a positive working environment [98]. Managers should create an environment where teams are not required to provide fast returns on investments into new product's research and development. If fast returns on investments are required, that will limit innovation within a team [31]. Managers should understand that innovation can be stifled by a profits first mentality. A profit-first mentality can overshadow the exploration time and the resources a team needs to develop innovations fully [31]. An innovation manager should be hesitant to implement strategies that limit

exposure to the inherent risks required to develop new innovative ideas [11, 115]. Management should allow a product or team to fail or be temporarily unsuccessful in developing new innovative products since innovation needs sufficient resources and time to be developed [11, 31]. Due to the unique nature of innovations, many ideas will result in failure for each successful product innovation [116-118]. Management should show teams and individuals through actions and words that they support and encourage innovation within the company to improve innovative efforts [39, 98, 119]. Additionally, management needs to screen ideas so that resources are given to promising ideas that can be implemented by the company [45, 112]. Table 4 summarizes the management style attributes that support innovation.

*Table 4 Management Style Attributes*

|  | <b>Attributes</b>   | <b>Reference</b> |
|--|---|------------------|
| <b>Management<br/>Style<br/>Attributes</b> | Allows Employees to have work variability                           | [20, 98]         |
|  | Displays non-controlling style                                      | [20, 98]         |
|  | Can match employees with the right job complexity or challenge      | [20, 39, 98]     |
|  | Is positive with individuals  | [98]             |
|  | Gives the employee the right degree of autonomy/ not micro-managing | [98]             |
|  | Sets reasonable and clear role expectations for subordinates        | [98]             |
|  | Is supportive of innovation   | [39, 98,         |

|  |   |                   |
|--|---|-------------------|
|  |   | 119]              |
|  | Supports and implements promising ideas | [38, 101]         |
|  | Accepts failure well                    | [11, 31, 116-118] |
|  | Is not short-term profit-oriented       | [11, 115]         |

Managers should be aware that team and company attributes can and will have an impact on employees and overall innovative performance. So, a manager should keep the attributes above in mind when selecting employees internally and externally.

So, to answer the question, *“How can an organization correctly identify predictors in hiring with the main purpose of improving its innovation capability?”*. First, a manager must seek individuals who possess the attributes and skills mentioned in the above tables. A manager should work with a hiring team to look for individuals who have the skills and attributes listed in Table 1 and Table 2 above. To increase innovation, a hiring manager should attempt to attract, classify, and hire individuals who possess as many of the individual skills and attributes as possible, with an ideal candidate possessing all skills and attributes. Second, a manager should work to develop a team that possesses the team attributes listed in Table 3 above.

Additionally, individual innovation may be stifled due to an incorrectly functioning team that does not exhibit the team attributes. It follows that an individual who has all the superior individual skills and attributes may not increase the company's innovate capability if the team does not exhibit innovative team attributes. A manager should

foster the current team and be diligent in hiring new individuals who will improve the team's attributes once added. The third attribute is how a manager functions as a manager of the team and individuals. To aid innovation, a manager should adopt management attributes that are supporting innovation, as listed in Table 4. These attributes will positively contribute to innovation capability within the company. A manager without these attributes can suppress the innovated endeavors of their employees and teams, even if the teams themselves have all the listed attributes in Table 3 and individuals that have innovated skills, as shown in Table 1 and attributes, as shown in Table 2. Therefore, a manager should adopt the management attributes that support innovation. Making efforts to develop a team that also displays the innovate attributes listed in the tables. Every company should have the goal of having an individual, team, and manager working together in concert for a shared goal of innovation.

## **4.2 Attracting Employees**

The second research question related to job analysis, *“How can a company develop an image that will attract individuals who will contribute to an improvement in company innovation capability?”*

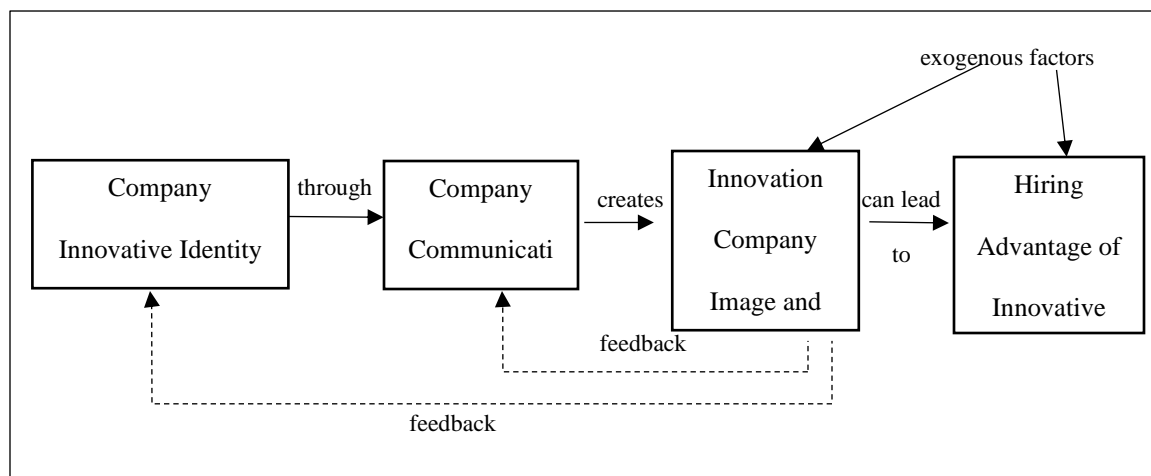
### 4.2.1 Innovative company image building

Attracting talented employees to a company is critically important [120-123], especially since there is a worldwide shortage of available talent [124-127]. In the current job markets, especially where applicants are limited, a company must first attract qualified applicants who have the necessary knowledge to perform required job duties [87].

Literature has shown that a positive company image will result in more qualified individuals apply job postings [128, 129]. Literature has shown that a company having an

“employment image” will improve the candidate pools, and the individual candidates desire to accept positions when offered [129]. Additionally, a company’s corporate brand image and a company’s employment image are positively correlated [128]. Grey et al. discussed an operating model for managing company reputation and image through company identity, image, communication, and reputation that would lead to a competitive advantage [130]. Grey’s model shows a progression from co-operating identity through communication to create image and reputation for a company with points of feedback where adjustments can be made [130]. The proposal is that this model can be extended to company employees for hiring innovative individuals.

*Figure 1 Innovative Hiring Operational Model*



The model proposed shows that a companies innovative identity how its identities are communicated to the public leading to an innovation company image and reputation and, ultimately, a hiring advantage . The model shows how a company can improve its innovative identity by the innovative project and products that it creates. Positive company image and the valuable products or services in the public consciousness will improve innovative identity through the feedback of positive communications within the

company and to the general public. The value in external public perception of image and view of internal company communications will result in an improved innovation image and reputation that can lead to increases in hiring advantage when the company is trying to attract innovative individuals.

Companies such as Apple, Google, Facebook, IDEO, and Tesla Motors attract talent based on the perception of being innovation-minded companies. Talented individuals actively seek out companies that are innovation-oriented as desirable places to work since there is the perception that an individual will participate in future innovations, allowing the individual to derive an increased personal self-image [123]. What factors are responsible for these companies thought of as innovative places of employment? Google is known as a creative workplace, having unique spaces for employees to conduct work. Google does not require employees to work in a single office or cubicle. Instead, Google allows its employees the ability to use unique spaces and locations within the Google campus for daily work. Google allows employees the freedom to use a portion of their time to work on whatever they want [131]. Google communicates about its unique working environment to the public through press releases and media interactions. Google's innovative identity is reinforced by the public's frequent interactions with its products, resulting in a reputation and image of innovation for the company. Google's innovation reputation and image are driving force in applicants desire to apply, resulting in over 2 million applications every year [131]. IDEO has a similar arrangement where employees can decorate and design a working environment that fits their personalities. Both IDEO and Google are highly desirable places to work, resulting in feelings of

increased self-worth and accomplishment when people get hired for positions and a larger applicant pool for both to draw upon for openings [123].

Tesla Motors is fast become an iconic design in the electric car industry, both in technical achievement, as a product that is developed by an entrepreneur who is changing the technical landscape of transportation, and Tesla's are a fashionable vehicle that the public desires to drive and own. Because of the entrepreneurial drive and the chic design, many technical people desire to work for Tesla [132, 133]. Tesla delivers news about features on its vehicles through several communications with the public, focusing on its innovative designs. Recently, Tesla released the Model X vehicle, which includes innovative falcon-wing doors that have been received well by the public [134].

People use many Microsoft products daily, so there is a desire to be working on productivity software used every day [132], coupled with a company with an excellent reputation for quality products and services [132, 135]. The daily interactions with Microsoft products have been an excellent platform for communication about the company for many decades since Microsoft is one of the founders of the modern computing industry. For a time, Microsoft was becoming stuck in developed technologies with few genuinely innovative products. However, Microsoft has changed and now strives for new product innovations such as the HaloLens, Surface tablets, and Azure cloud services, to name a few of Microsoft's recent developments. Recent innovations have changed the public's view of Microsoft, from a technologically stagnant old company into a company having a new product innovation renaissance [136, 137], which should result in many individuals applying to Microsoft who would not have before the change in company image from stagnation to innovation.



Facebook has created innovative services that are used by a large portion of the world's population daily. Recently, Facebook has been branching out into other areas of technology outside of its traditional social networking products, resulting in an increased perception of innovation. Facebook has customers that interact daily with its brand through its various products (Facebook.com, Facebook Messenger, Instagram, WhatsApp). Facebook improves its company brand image by continually developing new technologies, becoming known as a company with an entrepreneurial and innovation image that is being improved by new products and services in areas such as virtual reality, satellite internet for the undeveloped populations, and finding new uses for its messaging platform. Facebook's constant communication with its users and the new product innovation will improve the company's feedback of innovation reputation and image, which will lead to Facebook being sought out by individuals as a place to work. The desirability of work at Facebook will result in a large pool of applications for Facebook when filling positions.

Company innovation image and the communication of company innovation image improves a company's ability to attract potential employees to apply for open positions. Innovative individuals are looking for a company that has the image of being innovative. Many of these companies have unique products and cultures, but there are innovation attributes that individuals are looking for when applying to a position.

#### 4.2.2 Employment image building to attract creative people

Literature has found several attributes that a manager should look for in potential employees when filling open positions. A manager should be aware that a person will not look for new employment if a current job provides a satisfactory sense of self. However,

Individuals will enter into job candidacy when they feel the move to a new company will increase their self-image [123]. A company that projects a positive company image or brand to the public will increase its ability to attract talented individuals [121, 125, 138-141]. Researchers have labeled a company's employment image as the companies "Employee Brand" [124, 132, 142, 143], which correlates positively with a company's ability to attract better talent for critical positions [124, 132, 142, 143]. There are two main influences on the company brand, an applicant's awareness of a company [132], and the positive perception of company image [132, 135]. Overall, company reputation can be split into three reputation aspects: cooperate, employment, and social reputation [135]. According to Auger et al., a company needs to have a "good enough" reputation for attracting talented employees [135]. However, Auger et al. caution that reputation alone is not the only company attribute that will attract employees, even if it is an important attribute, companies also need to have attractive compensation, time demands, benefits, and working environment [135]. Amazon is hoping to improve its attractiveness and reputation as a place to work with a new initiative of allowing some teams to work 30 hours a week, getting full benefits but only paid seventy-five percent [144]. Amazon recently experienced negative news about how its workforce was treated [145].

According to Rita McGrath, the negative news has reduced the companies attractiveness as an employer [144]. From the research of Auger et al. the initiative by Amazon would help its employer brand in the areas of time demands and benefits since it offers the same benefits but a reduced time requirement, the new proposed schedule does reduce the compensation which in turn would reduce the attractiveness of the position for some. The working environment was not discussed and would probably not have a positive or

negative result when individuals were considering applying for positions with the new Amazon work schedule. Amazon is attempting to improve its overall employer brand image with the new proposed positions after some negative news and a reduction in employer attractiveness. Other researchers have developed frameworks to understand better what attracts employees to seek employment at a company. One such researcher is Davies, who proposed a five attributes framework for understanding the attraction of employees to a company. According to Davies, five attributes influence the employer brand. Those attributes are Agreeableness, Enterprise, Competence, Chic, Ruthlessness [132, 133]. Agreeableness measures the perception of warmth, empathy, and integrity of a company [132, 133]. Enterprise is a perception measure of a company's modernity, adventurousness, and boldness [132, 133]. Competence measures the perception of a company's application of technology, drive, and reliability [132, 133]. The Chic measures the perception of elegance, prestige, and elitism of working for the company [132, 133]. Finally, ruthlessness measure ego and dominance [132, 133]. Davies's survey found that agreeableness was the most important factor for a company's employment brand, and competence was the least important [132]. Additionally, management should not ignore the three remaining factors (chic, ruthlessness, and enterprise) since those three are still contributors to perceived employer branding [132]. Managers should understand that potential applicants are attracted to a company that fulfills a preference or need of a targeted group of possible individuals [124, 146]. Managers need to understand that employees are looking for an employer value proposition [124]. The employee value proposition can be summarized as the benefits of the company for an applicant when the company is compared to other potential employers [147]. Further, a company can

continue its brand image by making sure that human resource management delivers consistently on the promised image when recruiting [124]. Additionally, brand image should be honestly and effectively communicated to the targeted individuals [124]. Employer brand concerning innovation is not addressed in literature, but innovation branding can be improved by understanding both the attributes of an innovative individual and that potential employees are looking at value propositions and needs when selecting a company. Managers should develop a brand image that showcases the attributes of a company that line up with innovative individual attributes discussed earlier in the thesis in Figure 1. The goal of an employer image is to attract the required employees to fill vacant positions with quality individuals who will improve innovation within a company. It has been suggested that recruitment and normal human resource departments or personnel should be separated to allow the recruitment personnel to function more as salespersons [148]. Dedicated recruitment personnel or a contract firm can aid the company by selling the companies employment image as a product that is designed to attract the best talent from the job pool.

There is a lack of research and literature on discover, attract, and hire qualified applicants to improve the innovative capacity of an organization. Improved recruitment of innovative individuals should improve overall company innovation.

### **Corporate Brand Image**

Corporate responsibility is a company's ability to be "good citizens" and is linked to financial performance for a company; companies can use corporate responsibility to improve the overall image of company brands [149]. Corporate responsibility has been widely discussed in academic literature [150-153] and is a concept that managers need to

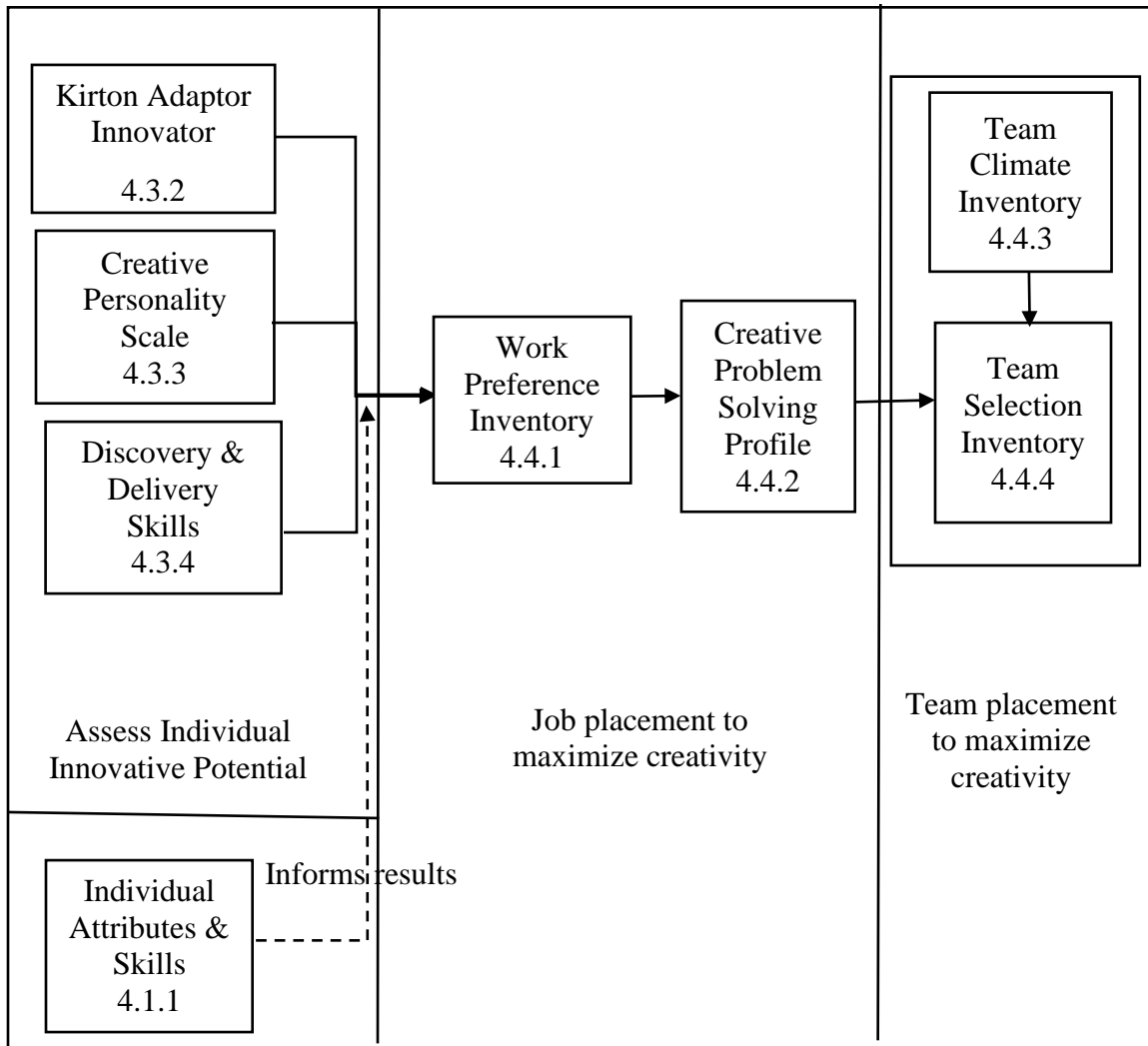
be aware of when making business decisions that influence more than the internal operations of the company. Consumers view companies and their products based on the overall image, including corporate responsibility [149, 154]. Corporate responsibility is a component of the company's overall image, projected to the general public and potential job applicants. Besides corporate responsibility, a company's image perception is also based on corporate brand image, corporate identity, and corporate culture; each is exerting influence overall company brand perceptions [155]. A company image perception is critical to a company's overall success since it is the perception or mental image the public holds of a company, the right image can lead to competitive advantage [130] while a poor image can do the inverse. From literature, it has been shown that a company's overall image is not based on a single factor. Instead, the overall image is based on several factors that will lead to overall company brand perception. Overall company image is a concept a manager should be familiar with since it also influences how to individuals looking for employment at a company will choose where to apply. A poorly perceived company will not have a qualified pool of innovative applicants to fill open positions. Therefore, a manager should make the company image, including employer brand image, their responsibility. Doing this will aid the company in increasing innovation capability.

Using the model suggested in Figure 1, a manager can use the positive interactions with the company, its communication, and company reputation to drive a hiring advantage during the recruitment process. If a manager is aware of the impact that the company image has on attracting employees, then there is a distinct advantage compared to competitors who are not aware of these attributes.

### 4.3 Assess the innovativeness of potential employees

The third research question is, “*How to effectively evaluate job applicants with a goal of improving a company’s innovation capability?*” Several methods have been proposed based on research into the evaluation of individuals. The methods used singularly will provide benefits to the hiring manager. However, to be most effective, a manager should use evaluation methods in combination. The combination of methods can allow greater insight into how an individual will contribute to innovation capability. The combination of methods will allow insight into individual innovation potential, how the individual will integrate into job functions, and become a member of a team with the goal of improving innovation capability. For this, a manager needs a framework to direct how the separate tests should be utilized in combination. The framework found in “**Error! Reference source not found.**” is the proposed way to combine the separate evaluation methods into a process that will improve the evaluation and selection process when trying to fill a position to increase innovation capabilities within an organization.

Figure 2 Framework of evaluation methods for Improvement of Company Innovation capabilities



The evaluation methods reviewed for the framework proposed in this thesis are self-reporting, Others Reporting, and biographical data. Focusing on the first three methods of evaluation leaves three other methods that could be utilized if a manager chooses:

assessment centers, interviews, and situational judgment tests. The last three methods will be briefly discussed below but will not be incorporated into the framework of this thesis.

Interviewing has been used as the primary method of hiring and evaluating individuals.

Usually, a potential employee is interviewed by an individual or a panel of individuals.

Questions in interviews typically are done in one of two ways. The first is a list of formal

questions given to the interview team by human resources that follow a more regimented question approach where a few questions are selected from a pool of standard questions. The other approach is for the interview team to ask questions in an ad-hoc manner based on what the interviewer sees fit as a good question to figure out if the potential employee will fit correctly into the existing position, normally both methods are looking for an individual-team fit. Typically, the more formal approach happens in larger organizations once the hiring process has become more formalized.

Assessment centers usually are independent groups that provide assessments of individuals based on specific information, a hiring manager or team desires to learn about potential employees. A larger company may have an internal assessment group, but smaller companies tend to use external services due to the higher cost associated with operating expenses of running the assessment centers. The goal of an assessment center is to incorporate some or all the items from the other evaluation methods to evaluate potential employees correctly. The other evaluation methods can be used within the assessment center since interviews or self-reporting testing can aid in the evaluation of potential hires. Assessment center use of the evaluation methods would require additional research to prove validity and reliable results. Also, Assessment centers cost more per evaluated applicant. In most cases, the additional cost outweighs the benefits of improved evaluations. Some companies have used biographical, other reporting, and self-reporting for a larger group of applicants to narrow down the field and then using assessment centers for remaining candidates to only be burdened with the cost of a few individuals. However, due to the higher cost of recruitment, a company may not use a center, even with the research that an assessment center would most likely provide a better selection



of employees. Finally, the company would need to either develop their assessment protocol, much like how Google has researched how to assess individuals during hiring [156]. Google has developed a data-driven assessment process that is designed to find the best possible employees for a position, a process that can take six weeks for the employee to progress through all the assessments [156]. If a company is large enough and willing to bear the financial burden, then a company could create an internal center. Otherwise, a company will need to find an external center that has or is willing to develop an assessment to find innovative individuals based on the company's criteria.

Assessment centers may use situational judgment testing as part of the overall testing plan. Situational judgment tests can stand on their own as a method of evaluation where a participant is presented with a problem and must find a solution. Depending on the test design, the assessor may evaluate either the outcome, the processes of arriving at the outcome, or both as a combination. A test would also need to be crafted so that the evaluation of the participants was based on measurable outcomes that are repeatable. Accurate situational judgment testing requires a situation to be directly presented to the participant, which can increase the time required for an evaluation, cost, and time associated with each participant who is evaluated. A company may use open questioning to ask a participant how they would react to a specific situation, but this form of judgment testing will also bridge to include self-reporting since the individual will not be directly confronted with a test situation. Some of the evaluation methods below may be adaptable to situational judgment tests, but the process of adapting the test would require further research to prove valid and reliable results.

#### 4.3.1 Overview of Evaluation Methods

There are several methods available to managers to use when evaluating individuals. Research has developed methods of evaluation for many of the aspects of an individual's starting employment at a company, from hiring through job selection and team placement. The number of evaluation options can be daunting for a manager when trying to evaluate an individual to best utilize their best potential within a company, especially innovative potential. A manager needs to develop a strategy to correctly evaluate a potential employee and then have them be utilized correctly within their group. A framework is needed to aid managers in improving innovation capabilities during the hiring and selection process. The proposed framework in **Error! Reference source not found.** is designed to improve a manager's ability to hire new talent and place the hired talent into the correct job role and team to improve innovation capability. The framework uses a collection of validated evaluation methods during specific phases of a potential employee's selection to determine if the individual will contribute to innovation and then place that employee into a job to allow the individual to best succeed at the company, especially as an innovator. Finally, the framework will aid the individual placement within a team so that the individual and team will better contribute to the overall company's innovation capabilities. For individual assessments, the framework proposes that a manager uses the following: Kirton Adaptor Innovator, Creative Personality Scale, and Discover & Delivery Skills. Once the individual is selected from the pool of applicants using the results of the individual evaluations, the Work Preference Inventory can be administered to determine the jobs for which the individual will be best suited. The framework suggests that the Work Preference Inventory will aid a manager in

placing the newly acquired individual into a job where they will make a difference in the company's innovation capabilities sooner than trial and error job placement. The framework suggests that an individual's job placement will be further improved by using the Creative Problem-Solving Profile. The Creative Problem-Solving Profile is used to determine the degree of an individual's abilities in the eight phases. The Profile states that a problem must progress all eight, from initiation to completion. The Creative Problem-Solving Profile is used in the framework by a manager after the results of the Work Preference Inventory to best select the project and task that a new employee is given to maximize their innovation capabilities. The manager can then select a person with the Creative Problem-Solving Profile who fits the gaps in current projects or problems facing the manager's team that needs to be filled. Finally, a current team should be evaluated using the Team Climate Inventory to find what is lacking to improve the team's innovation capabilities. The Team Climate Inventory guides a manager to the individual who will fill the teams need as determined by the Team Selection Inventory. A manager should use both team inventories in combination to evaluate an existing team and then evaluate an individual's impact when they are added to the existing team.

The framework is broken into three main sections. The individual section is done through three assessments: Kirton Adaption Innovation Inventory, Creative Personality Scale, and Discovery & Delivery Skills. The individual skills and attributes discussed earlier in the thesis can be used by a manager to help inform decisions during the interview process, if some of the evaluations do not provide favorable results, or if a manager needs to decide between multiple candidates. The next portion of the framework concerns job placement through work preferences and problem-solving styles through two assessments: Work

Preference Inventory, and Creative Problem-Solving Profile. The last portion of the framework is team placement through fit into a team with two assessments: Team Climate Inventory, and Team Selection Inventory.

The framework proposes a method to help a manager assess the individual who has the best potential to innovate at the company. Correct task placement of the employee will maximize individual creativity within the company. Placing the individual into a project phase using the creative problem-solving profile to determine where the candidate will make the best impacts. Team placement is accomplished by having team climates determined before the employee takes the team selection inventory. If this is done, the new employee can be quickly matched with a team that will benefit from the new member's innovative potential without waiting for the time it takes for other members of the team to take the evaluation, shortening the overall duration of the process. Over the next few sections, each of the evaluation methods will be discussed in more detail to expand the understanding of the framework.

#### 4.3.2 Kirton Adaption Innovation Inventory (KAI)

Kirton Adaption Innovation Inventory (KAI) is an evaluation method developed by Kirton to discovering individuals who are more likely to be innovators [95]. The 32 items KAI inventory has been shown to be a valid and reliable method of evaluating specific attributes that can be correlated to individual innovation [95, 157]. The KAI uses the supposition that individuals have an underlying personality attribute that is somewhere on the continuum from the adaptor to innovator [95, 157]. An adaptor is defined as an individual who improves the existing way or method used to solve a problem, which is different from an innovator who strives to find new ways or methods of solving a

problem [95, 157]. The KAI inventory is a 32 item [95, 157] self-reporting test [11] that is filled out by an individual and then scored by the test administrator. The KAI inventory is useful to help discover individuals who could contribute to disruptive innovation as innovators. Additionally, the KAI inventory will identify individuals who would contribute to sustaining innovation as adaptors [31]. Scoring of the KAI inventory's 32 questions will result in scores from 32 to 120, where an individual with a score higher than the mean of 96 will be deemed an innovator, and an individual with a score below 96 are deemed adaptors [95]. During the test, individuals rate each item, which represents a task or the presentation of one's self-image, which will need to be done consistently for an extended amount of time [95]. The test taker rates each item based on the degree of difficulty of accomplishing the task where one point means the item is "very easy" for the individual, and five points indicate the item is "very difficult" [95].

The Kirton Adaption Innovation (KAI) theory questions are designed to capture an individual's behavior towards ideas, group interactions, ability to stay on task, detail orientation, following current methods, and organizational preferences [95]. The KAI bases the adaptor items on concepts from Webber [158] and Merton [159], who helped develop the understanding of individuals who do things better within a structure or bureaucracy. The KAI inventory is different from many of the other evaluations since it is not looking for an affirmative from an adaptor individual. Instead, the KAI intends for the test taker to rate items lower, which would indicate difficulty in handling a given task. The negative direction of the questions in the KAI makes the KAI unique in the evaluation methods reviewed in the framework. The inventory is designed to present questions to allow innovators higher ratings on more items, giving the innovators a higher

score that indicates difficulty with items within the inventory. As an example, an individual may rate the question, “Has Original Ideas” with a numeric score of 2, which would indicate the task was easy for them to perform.

A different individual may rate the same question as a numeric score of 5, which would indicate the individual thinks it is challenging to have original ideas. An individual who may be an innovator or an adaptor might rate some of the questions equally, such as the question “Prefers to work on one problem at a time,” which could be rated by both as equally easy or challenging. The KAI looks for innovators not by what they find easy but instead by actions that will be challenging. Most of the questions in the KAI items will be scored lower by an individual who is an adaptor, which would result in a lower overall numeric score than the mean of 96. An innovator is more likely to rate the first 12 questions as a lower numeric score or easier. The remaining 20 questions in the KAI are designed to be more difficult for an individual who is an innovator. Alternatively, the same 20 questions will be found easier to accomplish by an adaptor individual. The innovator is more likely to believe most of the twenty tasks are difficult for them to accomplish, resulting in a higher numeric score for the individual. The question style makes the KAI test interesting since its questions are more likely to be rated lower by an adaptor resulting in an innovator being presented with more items that they will rate as difficult. The below table summarizes the 32 classic items from the KAI survey, denoting the items an innovator would find more challenging. The other evaluations positively ask an individual about strengths or personality traits, things that the individual finds easy, true about them, or things they are good at accomplishing. The KAI is looking for the inverse of the usual method, looking for the items that an individual will find difficult,

looking for something that an individual is not good at accomplishing or doing. A manager should take note of the questions included within the KAI since the evaluation is designed to find innovators by what the individual finds more difficult to handle [95], which allows a manager to give out assignments that will be best suited to individuals.

*Table 5 Kirton Items and Correlation to Innovative Attributes*

| <b>Item<br/>(Bold - Easier for an Innovator)</b> | <b>KAI Item [95]</b>                               |
|--|--|
| <b>1</b>   | Has original ideas                                 |
| <b>2</b>   | Proliferates Ideas                                 |
| <b>3</b>   | Is stimulating                                     |
| <b>4</b>   | Copes with several new ideas at the same<br>time   |
| <b>5</b>   | Will always think of something when<br>stuck       |
| <b>6</b>   | Will sooner create than improve                    |
| <b>7</b>   | Has a fresh perspective on old problems            |
| <b>8</b>   | Often risks doing things differently               |
| <b>9</b>   | Likes to vary set routines at a moment's<br>notice |
| <b>10</b>  | Need stimulation of frequent change                |
| <b>11</b>  | Can stand out in disagreement against the<br>group |
| <b>12</b>  | Prefers to work on one problem at a time           |

|    |  |
|----|--|
| 13 | Prefers change to occur gradually                      |
| 14 | Is thorough  |
| 15 | Masters all details painstakingly                      |
| 16 | Is methodical and systematic                           |
| 17 | Enjoys detail work                                     |
| 18 | Is a steady plodder                                    |
| 19 | Is consistent  |
| 20 | Imposes strict order on matters within<br>own control  |
| 21 | Fits readily into “the system”                         |
| 22 | Conforms   |
| 23 | Readily agrees with the team at work                   |
| 24 | Never seeks to bend or break the rules                 |
| 25 | Never acts without proper authority                    |
| 26 | Is prudent when dealing with authority                 |
| 27 | Likes protection and precise instructions              |
| 28 | Is predictable   |
| 29 | Prefers colleagues who never “rock the<br>boat”        |
| 30 | Likes bosses and work patterns which are<br>consistent |
| 31 | Works without deviation in a prescribed<br>way         |



|    |   |
|----|---|
| 32 | Holds back ideas until obviously needed |
|----|---|

The KAI items should be included as a complete test to get reliable and valid results since the test depends on all questions to give a final numeric score.

The adaptor questions are useful to hiring managers since, according to Kirton, since they provide an inverse or opposite view of an innovator [95]. The adaptor questions can be useful to “root out” the adaptors from an employment pool, thereby exposing the remaining innovators. A manager should check their prospective employees against the KAI items to examine if the individual shares more responses with an adaptor or an innovator.

A significant number of researchers have shown that KAI is a reliable and valid method of evaluation [160]. A hiring process aimed at finding innovators must incorporate the KAI inventory since it looks for both adaptors and innovators within a pool of applicants and could even be used as screening for the applicant pool before actual interviews are conducted. KAI items can be incorporated into self-reporting and interviews of prospective employees by a hiring manager with minimal or no modification. By restructuring or rewording the KAI items, a hiring manager could adjust the items to biographical by asking with a past tense voice. Also, the KAI items could be utilized with modification or rewording as an assessment by others, especially if the employee is moving within groups of the same company. The limited number of items in the KAI allows for it to be included within a standard evaluation process without adding undue time and cost to the overall hiring process. Additionally, the KAI would be best included in combination with another evaluation method to further filter innovative individuals

into adaptors and innovators. For example, an interviewee could be vetted with another method to determine if the individual shows innovated attributes, and then the KAI could be used to confirm the individual is an innovator or an adaptor, allowing further insight into the interviewed person. A hiring manager should use the KAI in addition to other methods as is being proposed in the framework since the test will give further insight into prospective employees and is an excellent addition due to the limited time and expense required.

#### 4.3.3 Creative Personality Scale (CPS)

The Creative Personality Scale is an evaluation method developed by H.G. Gough [161]. Researchers have included the Creative Personality Scale for a time in research after H.G. Gough released it in 1979. Hiring managers can use the scale for evaluation of individuals since it is a reliable and valid method. The Creative Personality Scale (CPS) comprises of 30 descriptive personality adjectives which can be chosen by the participant [161]. The descriptors can add or deduct one point to the participant's overall creative score, eighteen questions are additive, and the remaining twelve are deductive. Overall the scores can be in the range of negative twelve to a positive eighteen. Scoring is done by adding up all the positive descriptive adjectives and then subtracting the total of the negatives. The Creative Personality Scale items are listed in Table 6.

*Table 6 Creative Personality Scale Items [162]*

| <b>Item</b> | <b>Adjective</b> | <b>Scoring (Positive or Negative)</b> |
|-------------|------------------|---------------------------------------|
| 1           | Capable          | Positive                              |

|    |                  |          |
|----|------------------|----------|
| 2  | Artificial       | Negative |
| 3  | Clever           | Positive |
| 4  | Cautious         | Negative |
| 5  | Confident        | Positive |
| 6  | Egotistical      | Positive |
| 7  | Commonplace      | Negative |
| 8  | Humorous         | Positive |
| 9  | Conservative     | Negative |
| 10 | Individualistic  | Positive |
| 11 | Conventional     | Negative |
| 12 | Informal         | Positive |
| 13 | Dissatisfied     | Negative |
| 14 | Insightful       | Positive |
| 15 | Suspicious       | Negative |
| 16 | Honest           | Negative |
| 17 | Intelligent      | Positive |
| 18 | Well-mannered    | Negative |
| 19 | Wide interests   | Positive |
| 20 | Inventive        | Positive |
| 21 | Original         | Positive |
| 22 | Narrow interests | Negative |
| 23 | Reflective       | Positive |
| 24 | Sincere          | Negative |

|    |                |          |
|----|----------------|----------|
| 25 | Resourceful    | Positive |
| 26 | Self-confident | Positive |
| 27 | Sexy           | Positive |
| 28 | Submissive     | Negative |
| 29 | Snobbish       | Positive |
| 30 | Unconventional | Positive |

The creative personality scale has a relatively short number of questions with the 30 items, so it does not add much time or cost to the evaluation of individuals in the hiring process.

#### 4.3.4 Discover and Delivery Skills (DDS)

Christenson et al. proposed the Delivery and Discovery Quiz in the book *The Innovators DNA* so that an individual can be evaluated based on discovery and delivery skills showcased in the book [37]. Discovery skill is an attribute which an individual can use to “discover” new ideas created by associations [37]. In addition to associating the discovery skills also includes questioning the status quo, overserving surroundings, networking, and experimenting [37]. Delivery is the skill that an individual or organization uses to make an idea into a product; in other words, “delivering results” [37]. Both delivery and discovery skills are needed for a product to be realized, but most companies and training focus on delivery skills while underplaying or ignoring discovery skills [37]. The evaluation is done by giving the participant a self-reporting test of 20 questions and asking the individual to rate each question based on their actual behaviors, not their desired behavior [37]. Each question should be rated on a scale from one to five,

where one is strongly disagreeing, and five is strongly agreeing. To score the sum of the odd-numbered items are totaled, and the sum of the even-numbered items are totaled. The odd-numbered items are the individual's discover score, and the even-numbered items are the individual's delivery score. A score of 45 or above indicates the individual is very high on the discovery or delivery skills, a score of 40 to 45 indicates high, moderate to high if the score is 35 to 40, moderate to low if between 29 to 34 and low if below 29. The Discover and Delivery Quiz items are listed in Table 7.

*Table 7 Discover and Delivery quiz questions*

| Item Number | Question   |
|-------------|--|
| 1           | Frequently, my ideas or perspectives diverge radically from others' perspectives.  |
| 2           | I am very careful to avoid making mistakes in my work.   |
| 3           | I regularly ask questions that challenge the status quo  |
| 4           | I am extremely well organized at work.   |
| 5           | New ideas often come to me when I am directly observing how people interact with products or services.                     |
| 6           | I must have everything finished "just right" when completing a work assignment.  |
| 7           | I often find solutions to problems by drawing on solutions or ideas developed in other industries, fields, or disciplines. |
| 8           | I never jump into new projects and ventures and act quickly without carefully thinking through all of the issues.          |
| 9           | I frequently experiment to create new ways of doing things.  |

|    |   |
|----|---|
| 10 | I always follow through to complete a task, no matter what the obstacles  |
| 11 | I regularly talk with a diverse set of people (e.g., from different business functions, organizations, industries, geographies, etc.) to find and refine new ideas. |
| 12 | I excel at breaking down a goal or plan into the micro-tasks required to achieve it.  |
| 13 | I attend conferences (on my areas of expertise as well as unrelated areas) to meet new people and understand what issues are facing them.                           |
| 14 | I pay careful attention to details at work to ensure that nothing is overlooked   |
| 15 | I actively seek to identify emerging trends by reading books, articles, magazines, blogs, and so on.  |
| 16 | I hold myself and others strictly accountable for getting results.  |
| 17 | I frequently ask “what if” questions that provoke exploration of new possibilities and frontiers.   |
| 18 | I consistently follow through on all commitments and finish what I’ve started.  |
| 19 | I regularly observe the activities of customers, suppliers, or other organizations to get new ideas.  |
| 20 | I consistently create detailed plans to get work done.  |

The delivery and discovery skills quiz questions are useful for a manager since it will help in the assessment of a potential individual during the selection process. Additionally, the small number of questions allows the test to be easily administered during an interview session or as an additional test given to an individual pre or post-interview. A manager should include the delivery and Discovery skills test as proposed in the framework during the selection process since it will aid the selection of individuals.

#### 4.3.5 Discussion of Individual Evaluation Methods

The evaluations discussed in this section propose a framework to evaluate creativity and innovation. Each method is attempting to evaluate a portion of the complex interactions of innovation within an individual. These evaluation methods are attempting to correlate innovative individual and their innovative attributes to a series of questions. It would be possible to administer the evaluations in partial form, but that would not be hugely beneficial since the complete evaluations, with all the questions included, have been validated through research. Removing even a single question could reduce the accuracy and validity of the assessments. Administering all three of the evaluations should not be concerning to a hiring manager since each of the evaluation has a limited number of questions. The Kirton Adaption Innovation Inventory has thirty-two questions; the Creative Personality Scale has thirty questions, and the Discovery and Deliver Skills has twenty questions for a total of eighty-two questions. The below recommendation for an assessment should combine the questions into a single test. A hiring manager can administer the test to a potential employee with 16 groupings of questions shown in **Error! Reference source not found.** Items from each assessment should be grouped to allow instructions to accurately describe to the individual how to respond to each

grouping of questions. More than one group can be included at once if the testing medium allows a clear presentation of questions to the test taker.

*Table 8 Combined Individual Innovative Assessment*

| Group | Content from Assessments              |
|-------|---------------------------------------|
| 1     | Items 1 to 5 from the KAI inventory   |
| 2     | Items 1 to 5 from the CPS             |
| 3     | Items 1 to 5 from the DDS             |
| 4     | Items 6 to 10 from the KAI inventory  |
| 5     | Items 6 to 10 from the CPS            |
| 6     | Items 6 to 10 from the DDS            |
| 7     | Items 11 to 15 from the KAI inventory |
| 8     | Items 11 to 15 from the CPS           |
| 9     | Items 11 to 15 from the DDS           |
| 10    | Items 16 to 20 from the KAI inventory |
| 11    | Items 16 to 20 from the CPS           |
| 12    | Items 16 to 20 from the DDS           |
| 13    | Items 21 to 25 from the KAI inventory |
| 14    | Items 21 to 25 from the CPS           |
| 15    | Items 26 to 32 from the KAI inventory |
| 16    | Items 26 to 30 from the CPS           |

The combination of the KAI, CPS, and DDS evaluations described in **Error! Reference source not found.** would allow all the administration of all three tests without being a



significant time commitment in the interview process due to the limited number of questions present in each evaluation. The method of administration should not have any influence on the test reliability, so the questions could be given to the candidate in paper or digital form during the interview or sent to the candidate before the interview to fill out electronically or bring with to the interview in physical format having been completed by the individual before or after the interview took place.

#### 4.3.6 Evaluation methods and Individual Attributes

There may be a desire by a manager to shorten the number of questions in the evaluations, but that should only be allowed if further research is conducted to ensure the validity of the evaluations remains the questions are excluded since the initial validity studies were done will all questions. However, the number of evaluations and the questions contained should not take an applicant much time to fully complete, especially if administered externally to the in-person interview process. A manager should consider the administration of the evaluations at the beginning or end of the interview process or through online methods.

Assessing individual innovative potential is the first place a hiring manager starts when evaluating a potential individual for a company. The framework proposed in **Error! Reference source not found.** gives a manager a way to combine several proven methods for figuring out an individual's innovative potential during the hiring process. The framework suggests that a manager considers the influence of the individual attributes and skills discussed in section 4.1.1 to inform the results of the evaluations that are administered to a candidate for an open position. A manager can use the skills and attributes to narrow down the field of applicants, especially if there are multiple

candidates who have a similar score in the evaluations proposed by the framework. The individual attributes discussed in section 4.1.1 allow a manager to have further guideposts for the decision-making process.

The framework suggests that a manager uses the three evaluations in combination to assess individual innovative potential. The framework proposes that the Kirton Adaption Innovation Inventory, Creative Personality Scale, and the Discovery and Delivery Skills be used in combination, then the individual attributes can be used as an additional input to improve the outcomes further. The three will give a reliable and valid picture of the innovative potential of an individual, especially if coupled with the individual skills and attributes.

#### **4.4 Job and team placement to maximize innovativeness**

##### 4.4.1 Work Preference Inventory (WPI)

Amabile et al. developed the Work Preference Inventory (WPI) as a method to determine the motivation of an individual [162]. The primary purpose of the WPI is to determine if an individual is intrinsically and extrinsically motivated [162]. The secondary purpose of the WPI is to evaluate the type of work an individual prefers. The test is made up of thirty questions taken as a self-reporting test by the individual [162]. The analysis uses a primary and secondary factor to separate and categorize an individual's results [163].

Literature has shown that WPI delivers reliable results in accurately assessing an individual's motivational preferences [162]. Since the WPI assesses the motivation of an employee, the authors have suggested that the test could be valid to assess employees before placement into specific jobs [162].

Since motivation, especially intrinsic motivation, is a significant trait in innovative individuals, a hiring manager can use the WPI evaluation to provide insight about a potential employee when hiring [39, 162]. Amabile et al. designed the Work Preference inventory into thirty questions rated by a participant on a four-point scale from a value of one which indicates “never or almost never true of me” to a value of four which indicates that the question is “always or almost always true of me” [162]. The thirty-question inventory is broken into two groups of fifteen questions where in the first group, a higher value indicates extrinsically motivated, and the second group of fifteen questions a higher value indicates intrinsically motivated. Secondly, the WPI can be used by managers to evaluate if an individual has a preference for work types by grouping the questions into four categories, which are: challenging, enjoyable, outwardly noticed, or work that is compensated [162]. The secondary categories are designed to evaluate an individual’s personal preference for what kind of work they would like to perform [162]. The secondary factors are broken into ten questions each for both outward and enjoyment with five questions each for both challenge and compensation [162]. Challenge refers to an individual’s desire to be presented with a challenge, something that the individual has not mastered [162]. A high challenge individual will want to find work that gives them a personal challenge. Enjoyment refers to an individual's ability to find satisfaction, fun, and enjoyment in the work that they perform [162]. A person who scores high in Enjoyment will accomplish work because they enjoy the work. Outward is an individual’s desire to receive outward recognition for their work and accomplishment [162]. An individual who scores high in outward will do work because they are looking for recognition from outside sources, looking for recognition from peers and superiors. A

hiring manager is usually concerned with how to compensate for a position. Individuals have a desire to be compensated for work that they perform [162]. Individuals who are most interested in compensation will perform their jobs for the rewards they are given. The secondary categories of challenge and enjoyable are linked to intrinsic motivation. Challenge and enjoyability mean an individual who scored higher in the intrinsic motivation would also have a higher score in the challenge and enjoyment secondary factors. The same goes for extrinsic motivation and the secondary factors of compensation and outward.

To help the test not be easily manipulated by an individual there are a few questions where scoring is reversed, meaning if a person answers a one for the question, it should be scored as a four, the same goes the remaining values, two will be scored as three, three as two, and four as one. A little caution is needed when scoring these questions, but once the evaluator is familiar with the technique, the test will become simple to score. The WPI is directed to both students and working professionals; as such, the questions should be modified to use specific language that is relevant to the test taker. As an example, a student would be presented with the question, "I seldom think about grades and awards," whereas a working professional's question would be, "I seldom think about salary and promotions." Additionally, the Work Preference Inventory jumbles the questions so that a participant will not discern the intent behind the questions and attempt to give correct answers, skewing the results in the participants' favor [162]. Scoring is done by in two steps first by totaling the fifteen questions designated as intrinsic motivation and comparing that result to the fifteen questions for extrinsic motivation. The same is done for the second pairs of challenge/compensation and enjoyment/outward. By comparing

scores, a hiring manager can visualize the potential employee's mix of intrinsic versus extrinsic motivation. The hiring manager will also receive the added benefit of measuring the interviewee's mix of secondary factors, knowing if the individual enjoys challenge or compensation and enjoyment of work or outward notice. The questions are listed in Table 9, showing if the question would add to the intrinsic or extrinsically total, secondary assessment, and the question is reversed scored. The Work Preference Inventory items are shown in Table 9.

*Table 9 WPI items, Motivation, and Scoring*

| <b>WPI Question [162]</b>  | <b>Intrinsic (IM) or<br/>Extrinsic (EM)<br/>Motivation</b> | <b>Secondary<br/>Assessment</b> | <b>Reverse<br/>Scoring</b> |
|--|--|---------------------------------|----------------------------|
| I enjoy relatively simple,<br>straightforward tasks                              | IM   | Challenge                       | X                          |
| I prefer work, I know I can do well<br>over work that stretches my<br>abilities. | IM   | Challenge                       | X                          |

|  |    |           |   |
|--|----|-----------|---|
| I enjoy tackling problems that are completely new to me                                | IM | Challenge | X |
| I enjoy tackling problems that are completely new to me                                | IM | Challenge |   |
| I enjoy trying to solve complex problems   | IM | Challenge |   |
| The more difficult the problem, the more I enjoy trying to solve it                    | IM | Challenge |   |
| I want my work to provide me with opportunities for increasing my knowledge and skills | IM | Challenge |   |
| Curiosity is the driving force behind much of what I do                                | IM | Challenge |   |
| I want to find out how good I really can be at my work                                 | IM | Enjoyment |   |
| I prefer to figure things out for myself   | IM | Enjoyment |   |
| What matters most to me is enjoying what I do  | IM | Enjoyment |   |
| It is important for me to have an outlet for self-expression                           | IM | Enjoyment |   |
| No matter what the outcome of a project, I am satisfied if I feel I                    | IM | Enjoyment |   |

|   |    |              |   |
|---|----|--------------|---|
| gained a new experience   |    |              |   |
| I'm more comfortable when I can set my own goals  | IM | Enjoyment    |   |
| I enjoy doing work that is so absorbing that I forget about everything else   | IM | Enjoyment    |   |
| It is important for me to be able to do what I most enjoy   | IM | Enjoyment    |   |
| I am keenly aware of the [goals I have for getting good grades.] [income goals I have for myself.]                          | EM | Compensation |   |
| I am strongly motivated by the [grades] [money] I can earn  | EM | Compensation |   |
| I am keenly aware of the [GPA (grade point average)] [promotion] goals I have for myself                                    | EM | Compensation |   |
| I seldom think about [grades and awards.] [salary and promotions.]  | EM | Compensation | X |
| As long as I can do what I enjoy, I'm not that concerned about exactly [what grades or awards I can earn.] [what I'm paid.] | EM | Compensation | X |
| I am strongly motivated by the  | EM | Outward      |   |

|  |    |         |  |
|--|----|---------|--|
| recognition I can earn from other people   |    |         |  |
| I want other people to find out how good I really can be at my work                | EM | Outward |  |
| To me, success means doing better than other people                                | EM | Outward |  |
| I have to feel that I'm learning something for what I do                           | EM | Outward |  |
| I believe that there is no point in doing a good job if nobody else knows about it | EM | Outward |  |
| I'm concerned about how other people are going to react to my ideas                | EM | Outward |  |
| I prefer working on projects with clearly specified procedures                     | EM | Outward |  |
| I'm less concerned with what work I do than what I get for it                      | EM | Outward |  |
| I prefer having someone set clear goals for me in my work                          | EM | Outward |  |

It is recommended that the entire work preference inventory is given to individuals so that a complete picture is reached of both the primary factor of motivation and the secondary work preferences. A subset of the evaluation is not recommended due to the



need to keep primary and secondary factors balanced, and the validity of the test may be compromised. The work preference inventory is helpful for a hiring manager due to motivation being a significant contributor to an individual impact on innovative company capabilities.

A hiring manager may use the work preference inventory to evaluate a potential employee's primary motivational mode, intrinsic or extrinsic.

#### 4.4.2 Creative Problem Solving Profile (CPSP)

The Creative Problem Solving Profile, or CPSP, was developed by Basadur et al. [46]. The creative problem-solving profile developed by Basadur et al. is based on the concept that each individual fits primarily into one or two of four possible quadrants of problem-solving approaches or styles while partially fitting into the remaining quadrants [46]. The CPSP theory is based on a claim that a problem must progress through all four quadrants before it can reach a solution [46]. Each quadrant has two sub-items which make up the eight total steps that are described in the CPSP [46]. The CPSP states that a product or problem needs to travel through eight steps. The test is made up of a total of eighteen rows, each having four personal descriptors or 72 total personal descriptors [46]. The evaluation is completed by the participant rating each of the four columns a value of 4,3,2, or 1 only using each number once per row. For example, a participant may rate the first row of descriptors as a value of 3 for Alert, 2 for Poised, 1 for Ready, and 4 for Eager using each number a single time on that row. Then on the next row, the participant may rate the Patient as a 4, Diligent as a 3, Forceful as a 1, and Prepared as a two, thereby re-using the same four numbers again on this row, but still only using each number once per row. The test also contains six questions that are designed to be "Distractors" so that

the participants cannot easily figure out the methods used for evaluation and manipulate the test results [46]. The test is scored by tallying up the columns, which give the individual a score value for each of the following attributes: Ideation, Thinking, Evaluation, Experiencing [46]. Each of the rows is representative of an attribute which is the following: Ideation is problem finding then fact-finding, Thinking is problem definition and idea finding, evaluation is evaluation & selection of an idea, next comes the planning phase, then gaining acceptance of the plan, and taking action to accomplish the plan [46]. The four main steps can be related to employee attributes in the following manner, an individual who is stronger in ideation is referred to as generators, individuals stronger in thinking as conceptualizers, stronger in the evaluation as optimizers, and stronger in experiencing as implementor [46]. The CPSP intends to describe the problem-solving style of an individual and how they fit into a team [46]. It should be noted that the CPSP is used to define the style of how an individual solves problems, it does not define a specific personality trait but instead evaluates how that individual approaches problems. The CPS helps to define how an individual will fit into the phases of solving a given problem. Individuals may be stronger in one or two of the four main attributes, resulting in an improved capacity to handle certain phases of a product design [46]. The CPSP has been tested on hundreds of individuals and has shown to have high validity and reliability [46] as an evaluation method. Since the method is taken by an individual it is a self-reporting method of evaluation. A hiring manager could also use the CPSP to evaluate a current team or group and then look for an individual who would fill in missing attributes.

The total score for each column is tallied minus the distractor resulting in a maximum of 44 points possible for a single row. The outcome of the test is then plotted on a graph where evaluation versus ideation is on the horizontal axis, and experiencing versus thinking is on the vertical axis. Each of the four corresponding columns is placed on the graph starting with column 1 at the 12 o'clock axes, moving in a clockwise direction the next axis, which is column 2, continuing in the same manner for columns 3 & 4.

*Figure 3 Creative Problem Solving Profile showing the four quadrants [46]*

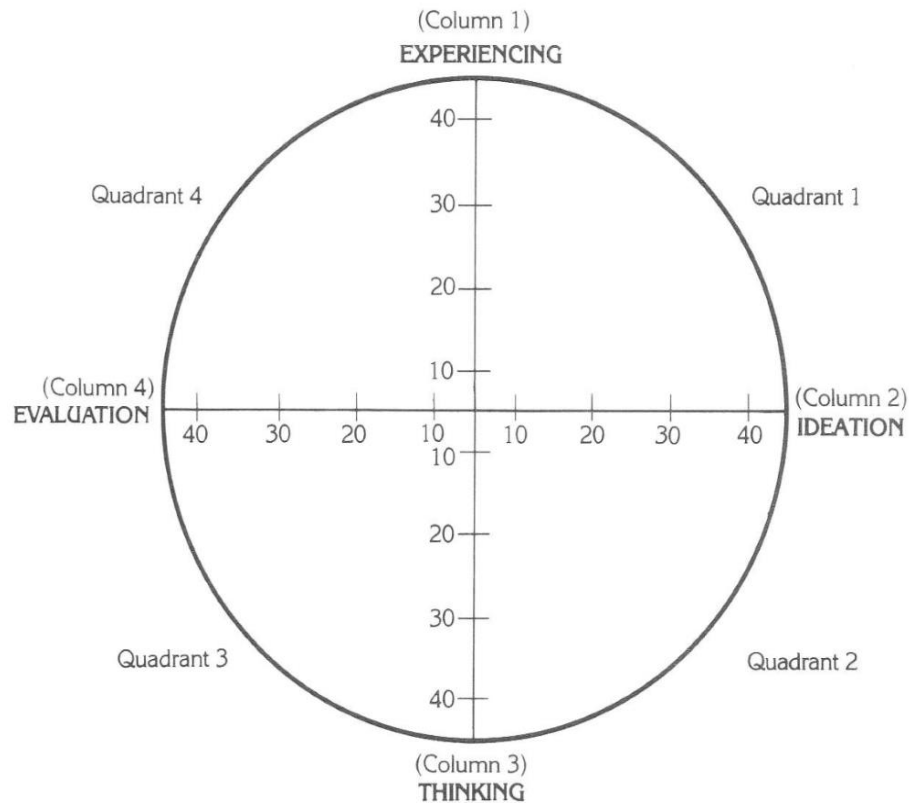


Figure 4 Columns and descriptions from [46]

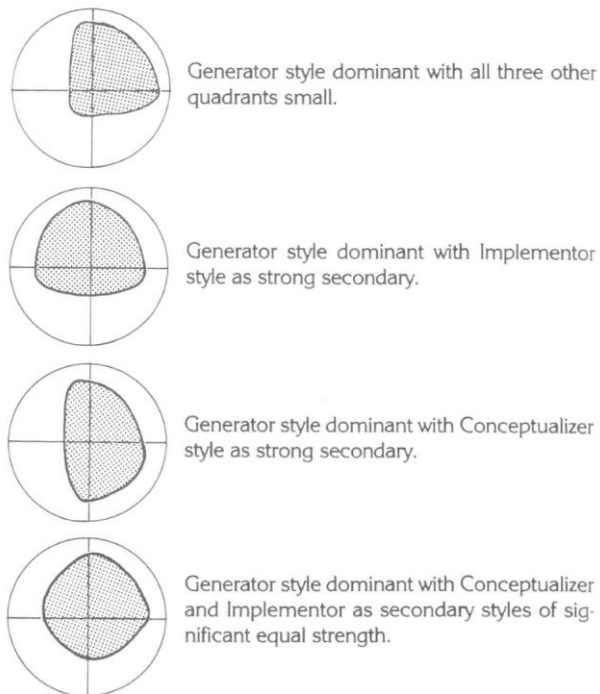
| Column 1                 | Column 2            | Column 3          | Column 4            |
|--------------------------|---------------------|-------------------|---------------------|
| 1. ___ Alert             | ___ Poised          | ___ Ready         | ___ Eager           |
| 2. ___ Patient           | ___ Diligent        | ___ Forceful      | ___ Prepared        |
| 3. ___ Doing             | ___ Intuitive       | ___ Detached      | ___ Selective       |
| 4. ___ Experiencing      | ___ Optimistic      | ___ Objective     | ___ Verifying       |
| 5. ___ Reserved          | ___ Serious         | ___ Fun-loving    | ___ Playful         |
| 6. ___ Sensing           | ___ Free Thinking   | ___ Logical       | ___ Experimenting   |
| 7. ___ Feeling           | ___ Alternatives    | ___ Analyzing     | ___ Evaluating      |
| 8. ___ Action            | ___ Divergence      | ___ Abstract      | ___ Convergence     |
| 9. ___ Direct            | ___ Possibilities   | ___ Conceptual    | ___ Practicalities  |
| 10. ___ Quiet            | ___ Trustworthy     | ___ Irresponsible | ___ Imaginative     |
| 11. ___ Involved         | ___ Proliferating   | ___ Theoretical   | ___ Testing         |
| 12. ___ Probing          | ___ Projecting      | ___ Structuring   | ___ Examining       |
| 13. ___ Immediate        | ___ Gathering       | ___ Understanding | ___ Confirming      |
| 14. ___ Impersonal       | ___ Proud           | ___ Hopeful       | ___ Fearful         |
| 15. ___ Implementing     | ___ Visualizing     | ___ Modeling      | ___ Decisive        |
| 16. ___ Present-oriented | ___ Future-oriented | ___ Rational      | ___ Detail-oriented |
| 17. ___ Sympathetic      | ___ Pragmatic       | ___ Emotional     | ___ Procrastinating |
| 18. ___ Aware            | ___ Childlike       | ___ Orderly       | ___ Realistic       |

The CPSP test can not be administered in partiality since it requires all columns to be filled for an individual profile to be constructed. Care should be taken to administer the complete test to assure valid and reliable outcomes. The test is comprised of the 72 descriptors in rows, as is shown in Figure 3. Once the test is scored, an individual can see how they rate on each of the axes. The score will show how an individual solves problems. Each quadrant is a mix of two-axes, creating one of the four problem-solving types: Generator, Conceptualizer, Optimizer, and Implementor. A Generator is a mix of Experiencing and Ideation, someone who can combine past experiences and new concepts or ideas in a way so that new ideas are generated, this person uses a high amount of divergent thinking to mix unrelated concepts. A generator operates with high amounts of ambiguity; they are great starters of ideas and can process a large amount of information based on their own experiences [46]. A generator helps to discover the problem and puts forth broad ideas, at the time connecting unrelated information, their

function is to find the problems and put forth global ideas that can become possible solutions. A Conceptualizer mixes Ideation and Thinking to create plans, hypotheses, and creates a definition of the generated ideas [46]. The conceptualizer is vital since they help to give a concept or idea the roots needed to start growing. In the conceptualizer phase, a problem starts to find possible solutions in the form of several possible plans. However, due to limited resources in most companies, only one or two plans can be taken, so the next phase is essential. The optimizer individual helps a company by mixing Thinking and Evaluation to flush out the best method to assess other options and implement an idea [46]. The optimizer refines the options that were set forth by the conceptualizer, narrowing the focus to the best course of action. The implementor mixes evaluation and experiences to find the best method of seeing an idea to its completion. An Implementor's primary mode of action is to implement the plan, idea, or method, which was determined in the previous phase by the optimizers. The CPSP progression shows that per Basur et al. and idea must pass from Generator to Implementator to fully be realized.

Figure 5 Examples of style mappings from Basur et al. [46]

(All Four Examples Below Have the Generator Style Dominant)



Also, individuals can have skills in multiple styles while having a dominate skill in one of the styles. An individual can have a robust primary skill and an almost equally strong secondary skill [46], meaning that an individual will seem to be able to function in both styles. A hiring manager should note this distinction because it means that a single individual will be higher functioning in a dominate skill, but they will be able to function in other styles with adequate proficiency.

The CPSP styles can be mapped to individual innovative skills. The Generator style associates ideas, observations, and experiences in a way that shows high levels of creative and divergent thinking. The Conceptualizer style takes the ideas and thoughts from the Generator and questions how they will fit into possible solutions. A

conceptualizer needs to be open to new experiences and has creative thinking skills, or else they will dismiss the seemingly unrelated associations presented by the generators. Convergent thinking will allow vague ideas to become grounded in what is possible. A conceptualizer and optimizer need expertise to allow the idea to find roots in what is possible with current methods of designing. Optimizers use convergent thinking and questioning of what can be done within constraints to narrow the possible solutions to a single method of attack, resulting in a plan that can be used by the implementors. An implementor will use their knowledge and expertise to test the plans and see if it can move to completion. Experimenting is vital to an implementor since they need to test the possible solution and return to earlier phases of the problem solving if the proposed plan does not work. The correlation to individual attributes or skills is summarized in Table 10.

*Table 10 CPSP Items*

| CPSP Style     | Individual Innovative Attribute or Skill   |
|----------------|--|
| Generator      | <ul style="list-style-type: none"> <li>• Creative Thinking</li> <li>• Divergent Thinking</li> <li>• Associating</li> <li>• Observation</li> </ul>                |
| Conceptualizer | <ul style="list-style-type: none"> <li>• Creative Thinking</li> <li>• Openness to new experiences</li> <li>• Convergent Thinking</li> <li>• Expertise</li> </ul> |
| Optimizer      | <ul style="list-style-type: none"> <li>• Expertise</li> </ul>  |

|             |   |
|-------------|---|
|             | <ul style="list-style-type: none"> <li>• Questioning</li> <li>• Convergent Thinking</li> </ul>                        |
| Implementor | <ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Convergent Thinking</li> <li>• Experimenting</li> </ul> |

The Creative Problem-Solving Profile will be useful to managers since it allows an individual to be evaluated primarily on innovative personal skills. The CPSP can give a good insight into how potential employees can fit into current work at a company as proposed in the framework in Figure 2 and should be considered by a hiring manager as part of the screening process for applicants.

#### 4.4.3 Team Climate Inventory (TCI)

The Team Climate Inventory developed (TCI) by Anderson et al. [163] is a four-factor theory that focuses on a team’s innovation capabilities. The test is designed to be given to managers or individuals within a team, thereby assessing a team’s overall climate. The TCI’s intention is to measure the current environment or “climate” of the team. From the assessment, a manager can see the strengths and weaknesses of a team. A manager should use the TCI in combination with other selection methods to re-task current team members or find new individuals who will improve a team’s strengths and fill in the weaknesses discover from the TCI assessment. The TCI is based on Anderson et al. theory that four main factors will predict innovation [163]. The TCI is designed to evaluate a team’s current climate in the four factors so that they can be used to predict the overall team’s climate for innovation [163]. The four factors are Vision, Participative Safety, Support



for Innovation, and Task Orientation. The TCI consists of a 38-item questionnaire with every single item rated by an individual on a scale specific to each of the four factors. The 38 questions derived from an extended 61 item test that was used to validate and create the shortened version.

The first factor evaluated is “Vision,” which tests whether or not a team of individuals motivated towards a shared goal with a focus on team innovation [163]. Vision describes how well the team members feel that they are in a group with clear direction and expectations. Vision is like the management attributes discussed earlier in the Thesis. As an example, Vision is similar to the previously discussed management attribute, “Sets reasonable and clear role expectations for subordinates [98].” The eleven Vision items are rate by the participant on a 1 to 7 scale, where one indicates “not at all,” and seven indicates “Completely.”

The second factor is “Participative Safety,” which is broken into two subfactors: Team Participation and Safety. Team Participation indicates that team members feel they can suggest ideas and be part of the team. Closely related to team participation is a team’s safety. Safety is the concept that any individual in the team is involved in team decisions without criticisms or judgment [163]. The two sub-factors combined into the overall factor of Participative Safety. Previously discussed in the thesis were team attributes that were linked to innovation. Participative Safety items ask similar questions to the attributes found earlier in the thesis. For example, the TCI asks “People feel understood and accepted by each other [163]” which is similar to the team attribute “Individuals feel able to share ideas with team [19, 82]” Four items from the TCI are dedicated to Team Participation which included the degree of personal interaction between the team

member's. Team participation was rated from 1 to 5, where one indicates "strongly disagree," and five indicates "strongly agree."

Additionally, within the participative safety, four questions were added to capture the amount of interaction between team members. An example of an interaction frequency question is, "We keep in regular contact with each other" [156]. The four interaction questions can extract from the theoretical model to account for job complexity or different cultural interactions [164]. Four items in the TCI are dedicated to Safety, being rated by the test taker from 1 to 5, where one indicates "a very little extent" and five indicates "a very great extent."

The third factor tested is "Task Orientation," which is when a team has a shared desire to perform tasks to excellence, with emphasis on accountability to improve policy, procedures, or methods within a team [163]. Task Orientation is broken into two subfactors, "climate for excellence" and "constructive controversy." Climate for excellence measures how well team members will promote excellence within the team [163]. Constructive controversy measures the degree to which a team will deal with different options or information by discussing them internally without destructive conflicts [163]. There are ten items of the TCI dedicated to "climate for excellence," where a score of one means "to a very little extent" and a score of seven means "to a very large extent" [163].

The fourth and final factor is "Support for Innovation," in which a good score would indicate that there are management and resource that are available to develop innovations [163]. Support for innovation in the TCI consists of eight questions rated by the tested individual from 1 to 5, where one means "strongly disagree," and five means "strongly

agree.” Support for innovation is present in the previously discussed management attributes that improve innovation. The most obvious being the attribute, “Is supportive of innovation [39, 98, 119].”

*Table 11 Team Climate Inventory Items [164] - \*Interaction Frequency*

| TCI Question  | TCI Factor | Evaluation Scale                 |
|---|------------|----------------------------------|
| How clear are you about what your team's objective are?   | Vision     | 1 = Not at all<br>7 = Completely |
| To what extent do you think they are useful and appropriate objectives?                                 | Vision     | 1 = Not at all<br>7 = Completely |
| How far are you in agreement with these objectives?   | Vision     | 1 = Not at all<br>7 = Completely |
| To what extent do you think other team members agree with these objectives?                             | Vision     | 1 = Not at all<br>7 = Completely |
| To what extent do you think your team's objectives are clearly understood by other members of the team? | Vision     | 1 = Not at all<br>7 = Completely |
| To what extent do you think your team's objectives can actually be achieved?                            | Vision     | 1 = Not at all<br>7 = Completely |
| How worthwhile do you think these objectives are to you?  | Vision     | 1 = Not at all<br>7 = Completely |
| How worthwhile do you think these objectives are to the organization?                                   | Vision     | 1 = Not at all<br>7 = Completely |
| How worthwhile do you think these objectives  | Vision     | 1 = Not at all                   |

|   |                          |   |
|---|--------------------------|---|
| are to the wider society?   |                          | 7 = Completely                                    |
| To what extent do you think these objectives are realistic and can be attained?     | Vision                   | 1 = Not at all<br>7 = Completely                  |
| To what extent do you think members of your team are committed to these objectives? | Vision                   | 1 = Not at all<br>7 = Completely                  |
| We share information generally in the team rather than keeping it to ourselves      | Participative<br>Safety  | 1 = Strongly<br>Disagree<br>5 = Strongly<br>Agree |
| We have a 'we are in it together' attitude  | Participative<br>Safety  | 1 = Strongly<br>Disagree<br>5 = Strongly<br>Agree |
| We all influence each other   | Participative<br>Safety  | 1 = Strongly<br>Disagree<br>5 = Strongly<br>Agree |
| People keep each other informed about work-related issues in the team               | Participative<br>Safety  | 1 = Strongly<br>Disagree<br>5 = Strongly<br>Agree |
| We keep in touch with each other as a team  | Participative<br>Safety* | 1 = Strongly<br>Disagree                          |

|  |                          |   |
|--|--------------------------|---|
|  |                          | 5 = Strongly agree  |
| We keep in regular contact with each other                               | Participative<br>Safety* | 1 = Strongly<br>Disagree<br>5 = Strongly agree            |
| Members of the team meet frequently to talk both formally and informally | Participative<br>Safety* | 1 = Strongly<br>Disagree<br>5 = Strongly agree            |
| We interact frequently   | Participative<br>Safety* | 1 = Strongly<br>Disagree<br>5 = Strongly agree            |
| People feel understood and accepted by each other                        | Participative<br>Safety  | 1 = a very little<br>extent<br>5 = a very great<br>extent |
| Everyone's view is listened to even if it is in a minority               | Participative<br>Safety  | 1 = a very little<br>extent<br>5 = a very great<br>extent |
| There are real attempts to share information throughout the team         | Participative<br>Safety  | 1 = a very little<br>extent<br>5 = a very great<br>extent |
| There is a lot of give and take  | Participative            | 1 = a very little   |

|   |                     |   |
|---|---------------------|---|
|   | Safety              | extent<br>5 = a very great<br>extent                            |
| Do your team colleagues provide useful ideas and practical help to enable you to do the job to the best of your ability?  | Task<br>Orientation | 1 = to a very little<br>extent<br>7 = to a very great<br>extent |
| Do you and your colleagues monitor each other so as to maintain a higher standard of work?                                | Task<br>Orientation | 1 = to a very little<br>extent<br>7 = to a very great<br>extent |
| Are team members prepared to question the basis of what the team is doing?  | Task<br>Orientation | 1 = to a very little<br>extent<br>7 = to a very great<br>extent |
| Does the team critically appraise potential weaknesses in what it is doing in order to achieve the best possible outcome? | Task<br>Orientation | 1 = to a very little<br>extent<br>7 = to a very great<br>extent |
| Do members of the team build on each other's ideas in order to achieve the best possible outcome?                         | Task<br>Orientation | 1 = to a very little<br>extent<br>7 = to a very great<br>extent |

|   |                           |   |
|---|---------------------------|---|
| Is there a real concern among team members that the team should achieve the highest standards of performance? | Task<br>Orientation       | 1 = Strongly<br>Disagree<br>5 = Strongly<br>Agree |
| Does the team have clear criteria which members try to meet in order to achieve excellence as a team?         | Task<br>Orientation       | 1 = Strongly<br>Disagree<br>5 = Strongly<br>Agree |
| This team is always moving toward the development of new answers  | Support for<br>Innovation | 1 = Strongly<br>Disagree<br>5 = Strongly<br>Agree |
| Assistance in developing new ideas is readily available   | Support for<br>Innovation | 1 = Strongly<br>Disagree<br>5 = Strongly agree    |
| This team is open and responsive to change  | Support for<br>Innovation | 1 = Strongly<br>Disagree<br>5 = Strongly agree    |
| People in this team are always searching for fresh, new ways of looking at problems                           | Support for<br>Innovation | 1 = Strongly<br>Disagree<br>5 = Strongly agree    |
| In this team, we take the time needed to develop new ideas  | Support for<br>Innovation | 1 = Strongly<br>Disagree                          |

|   |                        |   |
|---|------------------------|---|
|   |                        | 5 = Strongly agree                          |
| People in the team co-operate in-order to help develop and apply new ideas              | Support for Innovation | 1 = Strongly Disagree<br>5 = Strongly agree |
| Members of the team provide and share resources to help in the application of new ideas | Support for Innovation | 1 = Strongly Disagree<br>5 = Strongly agree |
| Team members provide practical support for new ideas and their application              | Support for Innovation | 1 = Strongly Disagree<br>5 = Strongly agree |

Since the TCI is derived from varying tests, the scale has meanings and values that are also varied to best ascertain the desired outcome from the questions [163]. For each factor, a higher score is desirable. Scoring is done by summing up the individual results and then averaging the summed individual results of the team for a factor. For Vision, the possible maxim score of 77, this indicates that a team’s vision is optimal. For Participative Safety, a manager is looking for a score of 60 and Task Orientation, a score of 45. The maximum score for Support for Innovation is 40. A manager can determine areas of improvement for a team comparing a team’s separate score to the maximum possible score for each of the four factors. It is recommended that a manager looks to improve the worst scoring.

The team climate inventory has a total of 38 items, and it is useful for a manager to understand the current innovative state of the current team. All members should be



evaluated if a comprehensive look at the current state of the team is desired. By analyzing the current team's environment, a manager then can understand how to adjust the team's climate. Additionally, the Team Climate Inventory can show factors missing in a team. The missing factors should be filled by adding individuals to the team using the Team Selection Inventory that will be discussed next.

#### 4.4.4 Team Selection Inventory (TSI)

The Team Selection Inventory (TSI) developed by Burch et al. [58, 111] was designed to function as a companion to the team climate inventory. The Team Selection Inventory is designed as a complement to the TCI evaluation method by allowing a manager to discover the preferred working climate of an individual and then establish a fit for that person into a team [58, 111]. The TSI test is 50 items that rate the individual's preferences on the same four factors present in the Team Climate Inventory. Those four factors are vision, participative safety, task orientation, and support for innovation [58, 111]. The TSI is a practical assessment to find individuals that will be a good "fit" into an existing team. If the individual will not be a good fit, then the TSI allows a manager to become aware of possible team-individual fit issues that can be reduced or eliminated by managing potential problem areas before they become an issue for the other team members.

The team selection inventory works in combination with the Team Climate Inventory [58]. The team climate inventory (TCI) is designed to evaluate an existing team, whereas the TSI is designed to evaluate existing team members or potential additions to a team individually. The TSI and TCI are used in combination with the first step being the administration TCI to create a team profile, once that is completed the TSI can be used to

select individuals to fit into the team who will improve overall performance and capabilities [58]. A hiring manager can be confident in using the selection inventory since it has been shown as a valid and reliable assessment tool to aid the evaluation of the potential of a new employee [58]. The potential employee can be given the Team Selection Inventory either as a self-report or by an interviewer through interview-style questions depending on the requirements of a company's hiring process. The fifty-item TSI can be useful for hiring managers who are looking to increase team performance within a company since the test evaluates person-team fit [58]. A manager should take extra care in reviewing the "support for innovation" section of the evaluation since those items have been shown to be beneficial for finding and improving a team's innovation capability. Of the 50 items, there are eight questions dedicated to "support for innovation," and the items are designed to relate to the individual's innovative perceptions directly. The TSI test is interesting since the "Support for innovation" items are designed to evaluate an individual's innovative perceptions without directly inquiring about innovative abilities. Indirect questioning about innovation is advantageous since most individuals will claim they possess innovative abilities due to the public understanding that innovation is a desirable individual trait for an individual seeking employment.

The TSI is administered in the same way as the TCI with an individual taking the test and rating each of the fifty items. The assessment asks items that assess an individual's desire for the four categories to be present within a team and how much each category matters to the specific individual. The same four categories are present in the TSI, that were in the TCI, those being: "Participative Safety," "Vision," "Support for Innovation," and

“Task Orientation.” Additionally, questions from each category are mixed up in the TSI to keep participants from noticing a pattern or grouping of questions that might skew results. Because of the scattering of questions, it would be beneficial to present the whole TSI to a potential team member, instead of just a selection of the test. Even though innovation is the focus of this thesis, it is highly recommended that a manager administers the complete test to an individual, looking in detail at the innovation section. The whole test will provide more complete results and will aid a manager in other aspects of team-individual fit that is outside of the scope of this thesis. Most of the TSI items are the same as the TCI, but the context is changed by the rating scale of “strongly disagree to strongly agree to a more individually focused question about if the item is “absolutely essential” to “not preferred” within a team [58]. The eight items from the TSI in the category “Support for innovation” are listed below in Table 12.

*Table 12 Team Selection Inventory "Support for Innovation" items*

| <b>TSI “Support for innovation” item [58]</b>                                      |
|--|
| Assistance in developing new ideas is readily available                            |
| The Team is open and responsive to change  |
| People in the team are always searching for fresh, new ways of looking at problems |
| The team is always moving towards the development of new answers                   |
| The team takes the time needed to develop new ideas                                |
| People in team co-operate in order to help develop and apply new ideas             |
| Team provides and shares resources to help in the application of new ideas         |
| Team provides practical support for new ideas and their application                |

By comparing “support for innovation” responses from the Team Climate Inventory with potential individual’s Team Selection Inventory, a manager can evaluate how well the individual will contribute to a team’s overall innovation. It is highly recommended to use both tests in combination as proposed in the framework in Figure 2, the TCI to baseline a team’s current climate, and then the TSI to place an individual for the team who will improve innovation capability. The whole TSI can more thoroughly evaluate potential individuals since it will provide a more detailed picture of the potential employee and how that individual will fit into the existing team.

#### **4.5 Discussion of the individual and team frameworks**

The proposal is that a manager can use the evaluation methods discussed above in combination to improve a company’s overall innovation capabilities. Using the framework proposed in Figure 2, a manager can select individuals using the KAI, CPS, and discovery and delivery skills (DDS). The individual attributes and skills listed in **Error! Reference source not found.** and **Error! Reference source not found.** can be used by a manager during the traditional phone and in-person interviewing process to inform the decision process. A manager should be familiar with the individual attributes and skills that are present in an innovative individual and use those to help inform the direction of the formal and informal in-person interview with a job candidate.

After initial innovation potential is evaluated, then job fit can be evaluated using the work preference inventory. Further innovative improvement can be facilitated through the creative problem-solving profile, which will aid a manager in utilizing the individual in the correct phase of a problem or project to unlock the individual’s innovation potential. Next, the framework suggests that a final team fit can be made by using the TCI and TSI

in combination to place the right individuals into correct team environments. The intention behind the framework is the first three tests (KIA, CPS, DDS) will show the innovation capability of an individual. Then the WPI and CPSP will show if the already understood innovation capability will translate to the tasks and phases of a project that an individual will be given as confines for their innovation. The TCI and TSI will guarantee the individual will correctly meld into the existing team and contribute to innovative team capability. Literature has shown that individuals who were evaluated high in intrinsic motivation by the WPI were positively correlated as an innovator when also tested together with the Kirton Adaptor Innovator evaluation [95, 162] and positively correlated to the Creative Personality Scale [161, 162]. On the other hand, extrinsically motivated individuals negatively correlated when they tested with the Kirton Adaptor Innovator and WPI evaluations [95, 162]. The negative correlation is a benefit to a hiring manager since this furthers the idea that a manager can give multiple evaluations to use the combination of the results to direct decisions about individuals and the hiring process. It is recommended that a hiring manager looks for positive results from all three test as a best practice. Alternatively, the hiring manager should be wary of outcomes if only one or two of the tests show positive results. Individuals who do not show positive results in any of the three tests should not be considered.

All six of the tests are short enough to be given in during an interview if there is enough time allocated or pre/post interview by written tests taken by an individual at a dedicated testing site, by mail, or using an online survey system.

A hiring manager should be aware of the evaluation methods requiring the potential employee to perform a self-evaluation, something that is not always practical or possible

within the interviewing processes while the potential employee is present at the company. The evaluations could be utilized by having the applicant take the tests before or after an in-person interview to allow the results to be tabulated and used in the final hiring decision. Evaluation methods that are testing based allow a hiring manager to utilize modern methods for administration of tests, including mailing tests, administering tests online, and application-based testing on mobile devices. Online tools can allow hiring managers to send tests to applicants through emails with an automatic return of the test results to the hiring manager once completed by the applicant. Sending out an evaluation is especially helpful since an asynchronous exchange can allow a manager to perform an initial screening to evaluate employees without the needed for the increased expense of the travel of multiple applicants. Prescreening can allow a manager to preselect only the applicant who will improve the existing team by prescreening the test results and only selecting the applicants that meet the attributes desired. The ability to prescreen applicants can reduce the number of onsite interviews, thereby reducing the recruiting cost involved.

A hiring manager can follow the framework proposed in **Error! Reference source not found.**, whether the evaluation is administered at the onsite interview or before. The framework proposes three methods to determine if an individual will be an effective innovator. If all three tests agree with positive results for the individual, then there is a high chance that the individual is prone to innovate. Inversely, if none or one of the tests shows innovation in the individual, then it would be best for a manager to keep looking for another applicant. A manager is required to make a judgment call if two of the three results that show if the applicant is an innovator. It is recommended that a manager check

if other candidates are available in the applicant pool if there have not been any positive results or partially positive results. If the applicant pool does not provide another option, then a manager can use their knowledge of individual innovative skills and attributes discussed in **Error! Reference source not found.** and **Error! Reference source not found.** to inform the manager's choice to proceed further along with the framework. If the manager does not know the individual, then an interview with the candidate can allow the hiring manager to ascertain if the candidate shows some of the individual attributes or skills discussed in **Error! Reference source not found.** and **Error! Reference source not found.** It is suggested that the manager should use the individual attributes to add more insight into the interview process. The individual attributes and skills should also be used for situations when multiple candidates have three out of three positive results on the assessments, and a tiebreaker is needed for the manager to choose between the candidates. In the case of multiple candidates, a manager should rely on the individual attributes and skills shown by the candidates during the interview process. Also, since the framework is only about the individual evaluation, a manager should look further along the framework to understand if the applicant would fit into a job or team such that the fit would offset the slightly lower individual score in one or more of the evaluations.

The manager's next step would be to follow the evaluations of the potential employee to see how that individual would fit into the task's assignments needed for the job functions or tasks at the company. The WPI gives a manager good insight into the jobs that will keep the applicant motivated. Since motivation is critical for innovation, this becomes critical for the possible employee. Practically a manager should seek out employees that

pair well with the tasks present in the current job opening. Alternatively, if a high potential employee is found, the opening can be modified to match the applicant.

The creative problem-solving style scale tells the manager how the individual will utilize their innovative abilities. A manager should use the results from this test based on what the company or team is currently needed to innovate. This test is one of the harder ones to fully apply as a manager since it requires some level of insight into the current needs of the team or company. However, if that is known, this test has the potential to allow new employees to unlock innovation capabilities. For example, if the company or team is also looking for innovations that require new ideas. Then the manager should seek out an individual that also has results with a CPSP showing a dominating problem-solving style of “generator.” Another example, if a company or team is lacking execution in the company’s innovative endeavors, then the hiring manager should look for positive results from both the framework and CPSP strength as an “implementer.”

The framework suggests that a manager uses the Team Climate Inventory to evaluate the current team environment during the job analysis phase of the hiring process. Using the TCI allows a manager to know where a team has gaps that be helped by a new hire. The framework in **Error! Reference source not found.** suggests using the TCI in combination with the Team Selection Inventory, as is suggested by the authors of the evaluation. The TSI evaluation is given to a potential candidate. The TSI matched to a TCI test that has been previously administered to the team that the candidate would be working within once hired. The paired tests will indicate how well the potential candidate will fit into the existing team and improve that team's performance. Coupling both the



TCI and TSI evaluations allows a manager to get a probable outlook of what would happen if a candidate joined a team.

The Creative Problem-Solving Scale and WPI will give the hiring manager additional information into a potential employee since it gives insight into the problem-solving style strengths, task preference, and how the individual will find a solution during all phases of a problem. KAI, CPS, DDS, and WPI will allow a manager better understanding an individual's innovative potential. Combining this result with the individual's problem-solving style and then fitting the individual into a team should provide improvements to innovation capabilities in a company. From the combination of tests, a manager can be confident in their selection of individuals for a position, and the team will contribute to innovation capability at a company. A keen manager will use each test for both individual evaluation merit and how they fit into the overall framework. Using all the evaluations within the framework will improve hiring managers to understand how a potential hire will contribute to a company's overall innovation capability and fit into the existing structure of the team.

#### **4.6 Retain and Improve creativity in the organization**

##### 4.6.1 Retaining Employees

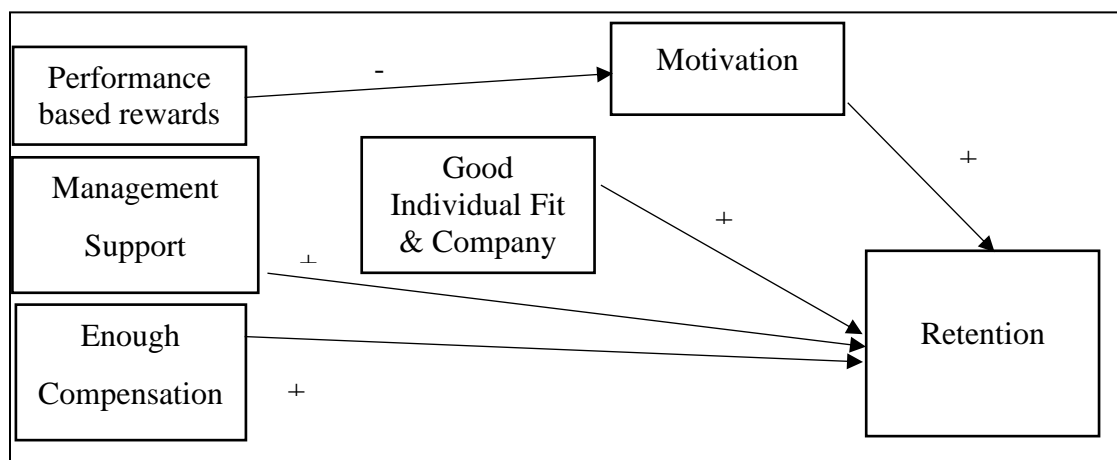
One of the challenges a manager of innovation faces is declining innovation capabilities due to employee attrition. It is not enough to correctly evaluate and find employees who will improve innovation capabilities, which was covered by research questions 1 to 3. A company must also be able to keep talented individuals from leaving a company to find employment elsewhere, especially after the company has spent time developing the individual. Employee retention, especially creative individuals, is critical for a company

seeking innovation capability improvement since literature has shown that creativity can directly impact innovation in a company [11, 44, 52, 53, 55, 165]. An individual can have a direct impact on company innovation capability [9, 10], so the retention of employees is a critical factor in a company's success. Retention also allows the hiring of individuals to improve a company's innovation capabilities instead of backfilling a vacancy to return lost capability. Research question 4 is concerned with this issue by asking, "*What will positively impact a company's ability to retain innovative employees?*" This question is designed to understand what an organization can do to keep innovative employees. A company should develop processes that keep employees and their creative and innovative contributions.

Without a plan for employee retention, a company stands to lose knowledge possessed by employees, thereby losing the creative and innovate output of the employee. Losing these employees, a failure in employee retention will reduce the company knowledge base due to the departure of the employee's knowledge and expertise from the company's overall pool [166]. Therefore, it is prudent for a manager to have a plan for retaining knowledgeable workers within a group and the company. Research shows a positive correlation between management support for knowledge workers and a company's innovation capabilities [86] and employee retention [167]. There are factors that are outside of the company's control that causes an employee leaving voluntarily [166]. Examples of an employee voluntarily leaving are employee life changes such as the employee's partner being relocated, family concerns that need the employee's full attention, and employees who changed career paths to an outside field. Research has provided many common nonvoluntary factors that will cause an employee to leave a

company and decrease employee retention. The common factors are shown in **Error! Reference source not found.**, with the influence they have on employee retention. It should be noted that this figure is for general employee retention and does not consider additional factors that creative employees seek in their careers, which will be handled in **Error! Reference source not found.** Personal preference will also influence decisions about continued employment with a company. Individual preferences should be watched for and considered by a manager to make sure each team member's circumstances are understood by the manager and are considered on an individual basis within organizational policies. The employee retention framework proposes that there are a few factors that can impact retention. The first factor is that performance-based rewards can have a negative impact on motivation, which will reduce motivation and subsequent retention. Management support, enough compensation, and an individual fit with the company will positively influence employee retention.

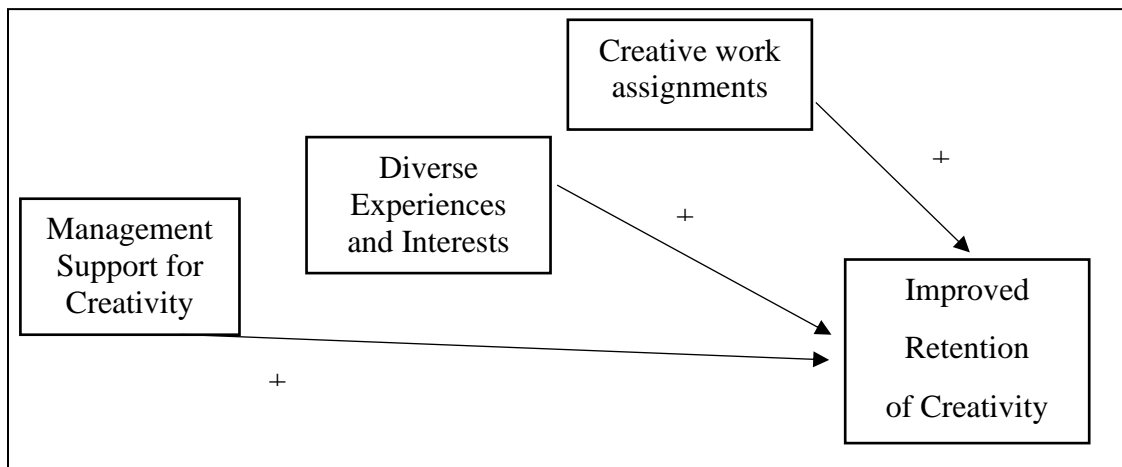
*Figure 6 Employee Retention Model*



To not lose innovative company capabilities, a manager should concern themselves with not losing the innovative employees at the company using the model proposed in Figure

7. There are several factors to consider to retain employees listed who will contribute to company innovation, and these factors are listed in Figure 6 about general employee retention and Figure 7 that is specific to retaining creative employees. The specific factors that positively impact creative retention are management support for creativity, allowing employees to have diverse experiences and interests, and being allowed to exercise creativity in work assignments. Again, the model used as a guide for the “in general” employee and should not be the only effort made by a manager. As always, in management, the manager should treat each employee as an individual. A manager should strive to consider the individual employee and make arrangements that are beneficial to the employee while still satisfying the policies and procedures that are required to be fulfilled to the company.

*Figure 7 Retaining Creative Employees model*



The proposal is that an innovative company and manager should have the goal of implementing both retention model suggested, the first for all employees, and the second for creative employees.

#### 4.6.2 Individual fit and its Influences on Employee Retention

Individual fit impacts a lot of the ways how the individual functions within a company. Company culture influences the attraction and retention of employees both in how an employee is attracted to a company and if the employee will stay working at a company. Horwitz et al. found that competitive packages, good headhunting practices, and sign-on bonuses will aid the company in attracting new talent, but the same practices do not have a significant impact on retaining the employee [87]. Retention will be improved by a company that has good compensation policies, a flexible work environment that supports work-life balance, and opportunities for advancement [166, 168-170]. For innovation to happen, a company needs a culture where there is enough trust to share ideas without negative effects on the individual [19, 82]. The same attributes will aid in the retention of employees since an individual will not stay around when other members of the company do not value their ideas. Employees will leave a company if they do not fit into the company culture [171]. Literature has shown that employee retention is reduced when the employee does not feel that they are supported by the organization, especially if the employee does not feel supported by direct supervisors [167]. Without good working relationships with other employees, the company will cease being a desirable place to stay employed [166]. Team interactions and climates have an impact on employee retention. A company should provide the best possible working environment where an individual feels they are supported by management and their team. Without this supportive environment, the company will lose valuable employees. A manager should think of themselves as the first line of defense against employee attrition. As discussed, attrition can be out of the control of the manager. But the factors in control should be

carefully monitored to the best of a manager's ability to keep most employees in the organization.

#### 4.6.3 Compensation and Rewards Influence on Motivation and Retention

Correct financial compensation for a position viewed as having a positive correlation to employee retention, in common terms, wages, and benefits that are appropriate and expected for the job function and job location. It is in the best interest of a company to understand the impact of rewards and compensation on employee retention. The fifth research question, "*What type of compensation and rewards policy will positively impact a company's innovation capability?*" is designed to help answer this question. It is important to note that each employee and employer is a unique situation. Therefore, they may have additional requirements outside of direct financial compensation and should be handled on an individualized basis if company policies allow flexibility. Motivation, especially intrinsic motivation, is widely known as a critical component of individual innovative and creative output [5, 39, 52, 98, 99, 106, 107]. If a company makes improvements to an individual's innovative ability have been correlated to the overall company's innovation capability improvement. A motivated employee is more likely to stay at a company, so it follows that motivation improves retention [170]. Motivation is highly linked to retention; properly motivated employees tend to continue their employment with a company longer than unmotivated individuals. It is common knowledge amongst managers that a motivated employee is more likely to stay with a company. Overall individual motivation comes from a wide number of sources, which may vary from person to person [172], but research has shown that there are common motivation factors in most individuals. An employee requires several factors to be

motivated, the first being correct compensation that would include base pay with the correct additional benefits expected for a position. An example of the additional benefits is that an employer would offer health, dental, retirement, and disability, to name a few of the possible things a company can offer to their full-time employees. It is commonly understood that a part-time, contract or temp employee may not receive the same additional benefits that a full-time employee would for the same job. Additional base pay may be normal in some cases to offset the lack of additional benefits; this is common for a contract employee. A company's human resource department should know what compensation is expected for a given position. A manager should be aware of the compensation expectations for their current and potential employees. It will be assumed that the company administers employee compensation within the allowed legal requirements of a region [63]. However, a manager should note that for any position, there exists a minimum expected compensation above the legal limits that need to be within the market range and geographic location for a given work function.

Compensation is broken up into three categories: direct tangible, indirect tangible, and intangible [63]. While tangible rewards can be measured and quantified as a monetary value [63], intangible rewards are the ones that cannot be easily quantified [63]. An example of tangible compensation would be base pay, benefits, and merit-based compensation. Intangible compensation is more varied based on the individual, but it can be things like local or global beneficial impact of the work, belief in the mission and vision of the company, religious influences, and recognition for doing the work. Indirect tangible is a benefit that is not directly monetary but is something that is easily quantified. Examples of indirect tangibles can be service bases, for instance getting

special treatment somewhere due to position, such as better customer service and direct technical support supplier's business when making personal purchases. Another example of an indirect tangible that is not direct pay but has monetary value is reduced cost for personal services, free meals at the office, or services that are paid for by the company like dry cleaning, onsite fitness, pet care, or entertainment. Indirect intangibles have been rising in popularity with many of the top technology companies like Google [173], Apple [174], and other top technology firms [175]. Correct compensation will improve employee retention, but are there other influences to consider above just "keeping people around"? Literature suggests that tangible monetary compensation can be a demotivating factor when not offered adequately, but it will only keep a person going for a time. After that point, intangible compensation becomes the main drive for motivation [90].

Maslow's hierarchy of needs echoes this concept: moving up the hierarchy becomes less about tangible and more about intangible. For example, according to Maslow, the need for self-esteem and self-actualization is higher than the need for safety [176]. Once compensation is enough to allow individuals to feel financially safe, the higher-level needs such as self-actualization and self-esteem, become more important to the individual. Rewards are additional payment above average compensation. Contrary to what most people think, it has been shown to have a negative impact on an employee's long-term performance, because continued rewards would be expected to maintain the performance [90]. As a result, it has also been shown to have a negative impact on intrinsic motivation. [52, 90] Reward-based systems may exhibit a short term increases in creativity or motivation, but long term use of rewards may see a reduction in both creativity and motivation [90]. Additionally, a manager cannot continue to make



increases in compensation to improve motivation since the increases will become increasingly financially unviable since every company must deal with limited financial resources and will run out of available finances after a time. A manager should think of appropriate compensation for a region and function as the minimum required to nurture motivation. Without correct compensation, innovation will decline due to employees becoming demotivated, and with the correct compensation, the other attributes of motivation will become the employee's focus. A manager should be aware that insufficient compensation will become a demotivator for the individual [90] and also that financial compensation alone is not sufficient to retain employees [88, 89] other retention factors also must be considered. From this, it becomes apparent that employee compensation and benefits can be viewed as an extrinsic motivator. Compensation was discussed by Horwitz et al., who found that the single largest retention issue companies face due to knowledge workers switching jobs because pay and prospects are better at another company [87]. Correct compensation for each employee needs to be appropriate and correct for that employee's role, responsibilities, and title. Therefore, insufficient compensation will result in increased employee turnover and be a demotivator to the employees who remain at the company. A manager should be aware of current market compensation rates for their employees, increasing an employee's compensation as required to match compensation increases within the employees' job market, especially for critical individuals within the company. Compensation matching is especially important for the knowledgeable and skilled employees within a company since those individuals possess a greater amount of company's knowledge pool which will be lost if they leave the company. Additionally, employees have an expectation of fairness when

comparing salaries to that of a coworker [177]. So compensation should not only be comparable to the external market, but also be equivalent between similar job functions within the organization. So, a manager should understand compensation both internally and externally, making an effort to keep their employees from becoming demotivated or looking for other opportunities.

#### *Further Discussion on Rewards*

Rewards warrant additional discussion due to the problematic nature of them for managers since rewards can cause short term gains while resulting in a long term reduction in company capabilities. Adding more details will help clarify how rewards can and cannot be used by a manager.

Rewards are short term compensation given to an individual employed by the company. Where rewards differ is that rewards are given for a more specified accomplishment or action on the part of the employee. For example, an employee's compensation includes all the money and benefits reasonably given to an employee: retirement, salary, time off, and health insurance, to name a few. Rewards usually are a more specific item, such as a manager giving bonus money or paid time off due to better performance on a specific job or task. Rewards can be thought of as additional compensation above what was negotiated at the beginning of employment. Since a continual reward will eventually become expected compensation, this will result in an individual requiring higher and higher levels of rewards to keep the same extrinsic motivation levels. Eventually, the company cannot keep increasing the level of rewards, or the company will stop the current reward level, and then the employee will stop being unnaturally incentivized to perform and most likely will see a negative impact on extrinsic motivation. Rewards can

also cause internal team competition, especially when the whole team is competing for a reward that is only available for a single or a few individuals based upon some performance metric. A competitive team reward may reduce internal knowledge and idea-sharing, which will negatively impact team creative and innovative outputs. Literature has shown that internal team competition will decrease team innovation [38, 39]. If a reward is necessary, the team reward should be given to all the employees equally to eliminate any possibility of internal team competition. Also, a manager should be careful when giving any reward to make sure the reward is not performance-based since the reward can become an expectation when a similar action is performed in the future. Limiting performance-based rewards, which will keep the team from experiencing negative impacts on motivation [90]. There is a temptation to use rewards since there will be a short surge in a team or individual motivation and performance directly after administration, but the influences will not last and can result in lower overall output from the group. So, a reward should be avoided, and other means should be used to motivate a group to perform. There are rewards other than financial that can impact employee retention. Recognition is one of the non-financial rewards that can increase retention [178]. A manager should make sure not to overuse recognitions but instead, give recognition to employees for excellent work performance [178]. It may be discouraging for a manager who is trying to figure out how to increase motivation and employee retention to find out that rewards, primarily financial, will not improve employee retention in the long haul. However, a manager should be aware that there are other ways to increase retention; the first is actively working to improve motivation. From the research, a conclusion can be drawn. Keeping employees motivated and

correctly compensated for a position will increase general employee retention. Non-monetary rewards and recognition have limited use, but if overused or used in an incorrect manner, those will have a negative impact on motivation. Overall there are ways a manager can improve motivation and correctly implement compensation and rewards/recognition to keep employees retained.

#### 4.6.4 Improving and Retaining Employee Creativity

A company can maintain an employee's tenure but to lose the employee's creative ability. Colloquially managers will discuss this by saying an employee has become "disengaged," "not finding unique solutions," or "not suggesting new ideas." A large portion of these issues is the result of managers not knowing how correctly to nurture and improve creativity within their teams and the company. Motivation has been discussed previously in the thesis; without motivation, an employee's creative output will reduce over time. Therefore, continued motivation is critical for an employee, so placing the employee in the right job and team becomes useful since it can help motivation.

Creativity is a critical component of a company's innovation capabilities. Therefore, a company that is seeking to improve innovation capabilities should seek to retain creative attributes within its employees and retain the employees who display these attributes. A manager should be actively involved in discovering, improving, and retaining creativity within their teams and the whole company. It should be clarified that retention in this section is not just about keeping the employee at the company, but also retaining their creativity while employed.

Methods a manager can use to evaluate an individual's creative potential has been discussed previously in this thesis by the proposed assessment framework in Figure 2.

Once an individual's potential is evaluated, and the individual is selected to be employed by a company. The manager should retain the individual, and as such, the individual's creative output will also be retained at the firm.

Managers have an enormous impact on an individual, teams, and company's creativity and employee retention [170]. Managers with direct reports who are in new product development are the front line in a company to both improve or destroy creative processes within an individual or team. Additionally, direct managers are critical in keeping creative employees since they interact most frequently with the individual members of a company. Managers should attempt to use approaches, attitudes, and actions towards and to their employees, which will improve and retain creativity within a company [179]. Also, managers should understand that there is not a single approach that will generate peak creative output from employees [179], but instead, there are several approaches that will provide a part of the overall equation that will improve employee creativity. One of the approaches a manager should take is that there should be clear employee role and job expectations that are coupled with processes to aid creativity [98]. Clear expectations between management and employees will build trust, which in turn will create the environment in which creativity can be improved [180]. Communication of the importance of trust within a company will correlate to increased individual creativity within an organization [180]. A manager should treat failure as an opportunity for individuals and a team to grow and learn from the failure and not as an exercise in where to place blame [180]. By acknowledging both successes and failures, a manager can build trust since employees will know that both successes and failures are accepted and acknowledged by the company.

A manager should concern themselves with retaining a creative individual since this will retain that individual's creative output for the company. Creative individuals want to be creative within their work; these individuals naturally want to do good and creative work [181]. An organization, including direct managers, should be supportive of creativity [181]. By building a supportive environment, the manager can demonstrate that they are responsible for inspiring creativity within an individual and the team [181]. A manager can improve the retention of creative employees by building a supportive environment for individual creativity [181]. Creative employees are more likely to leave a company if a manager is not proactively managing in a way that supports creative endeavors [181]. If a manager is not supportive of creativity, then additional interventions will probably not be successful [39]. Creativity is further enhanced when managers remove obstacles in the way of an employee's path to creative output [181]. So, managers should both removed obstacles and lead their team to become creative. Another method for improvement is to enroll themselves and teams into creativity training programs and activities. Literature has suggested that training in creative problem solving will correlate to improved creativity in an individual who is underperforming in creativity within a team [182]. The literature further suggests that a wide range of interests, contact with individuals outside of an employee's team, and diverse experience will improve an individual's creativity [37, 105, 182]. Employee creativity can be enhanced through diverse experiences obtained by allowing employees to work on a variety of tasks and jobs [20, 98]. Interacting with a diverse and broad group of creative individuals external to a company has been shown to improve creative output [183, 184]. As an example, Steve Job's took a calligraphy course while in school, something that was outside of his regular coursework,

this experience by Job's helped Apple design the Macintosh computer's word processor with great typography-based fonts [185]. These new fonts and the Apple computer revolutionized the word processor changed the way many employees performed job functions and paved the path for modern office computing. A manager should look outside of the company for employees to participate in networking and leaning opportunities. A manager should for a wide range of learning channels not just look at learning channels in areas of that directly relate to employee's normal job duties. A manager should keep from placing a creative employee into a fixed task type or job function since this will reduce an employee's creativity. Managers should become advocates for employee creativity through the encouragement of creativity training and employees having a broad range of interests, even ones which do not directly relate to current job functions or tasks.

#### **4.7 Discussion of the employee retention modes**

A manager should use both models in combination to retain employees who will contribute to innovative company capabilities. The model proposed in Figure 6 should be considered by managers as the general case for all employees and should be thought of as the starting point for creative individuals. Without the items in the general employee retention model being satisfied, a manager shouldn't attempt to satisfy the model found in Figure 7. Working on the creativity model before the general employee retention model would be like trying to fix the walls of a house when the foundation is crumbling, it wouldn't be worth the effort.

The model in **Error! Reference source not found.** proposes that there are four positive attributes that aid in employee retention and one negative attribute. A manager should

follow the model's suggestions of positive attributes to increase employee retention. The first step a manager can take is to hire an individual who will fit into the company, the company vision, and company goals. This thesis discussed the influence that individual fit has on an employee's retention. A manager should be transparent with potential applicants to the nature of employment at the company; dishonesty will only lead employees leaving the company. If a manager is honest with applicants, then they will be able to select the company based on the merits that are important to them individually. The second attribute is that a manager must be supportive of the employees that are in their reporting structure. One of the reliable ways to reduce employee retention is to remove management support. Therefore, a manager should always be mindful that their success is coupled with that of the employees and keep supporting the managers' employees. Insufficient compensation is another reliable method to decrease retention. A manager should be attentive to keep compensation lined up with the expectations of each employee's job function and location. Motivation and rewards are connected to the model. A manager should not attempt to use rewards to stimulate motivation since the literature has shown that reward will eventually demotivate an individual. Motivation has multiple sources that can vary between individuals. Several sources of motivation have been covered in this thesis. A manager should get to know their direct reports and what motivates them professionally and personally. All managers should strive to motivate their employees to the best of their abilities.

The model proposed in **Error! Reference source not found.** shows a manager how to retain a creative individual who will contribute to company innovation. The model proposes three positive attributes that a manager should develop to retain creative



employees. The first attribute is to assign creative work to the individuals. Creative staff will get bored without creative assignments and begin to look elsewhere for an outlet for their creative energy. Therefore, a manager should keep a sufficient flow of creative assignments directed to the innovative personnel in their teams. A manager should keep in mind this does not mean that every assignment must be a creative one, but that there must be a sufficient number of creative outlets for the creative staff to keep them engaged. The second attribute is like the first attribute. A creative individual can become bored without diverse experiences and interests. An employee who is creative will become uninterested after doing the same task repeatedly several times. The creative mind looks for new experiences, so a manager should attempt to keep the flow of new tasks fresh and new to the creative members of their teams. The last attribute ties the other two together. Management needs to be supportive of creativity in the employees. Without support from management, employees will become discouraged and begin to look elsewhere to allow their creative ideas to take flight. A creative person needs an outlet for their creativity if the current company is not providing the outlet, then they will look elsewhere. A manager can show that they support the creative process by being vocal about their support of creativity and the process of creativity, even when creativity is a little messy. Management support for creativity and innovation was covered in detail in section 4.1.2 of this thesis and summarized in **Error! Reference source not found.** A manager should review and follow the attributes listed in section 4.1.2 and **Error! Reference source not found.**

A manager who follows the model listed in Figure 6 and Figure 7 will increase the retention of employees, including creative employees. The increased retention of creative

employees will retain knowledgeable workers in the company and increase the innovation capability of the organization.

## **5.0 CONCLUSION**

This research contributes to the current understanding of innovation management by developing frameworks to fill gaps that exist. Through the literature review, many evaluation methods types were discussed, and several individuals and teams were combined into a framework of which use would aid both future researchers and managers looking to fill positions in their companies. The choice was made to use existing methods since these evaluation methods have already been proven to be reliable and valid for testing. The frameworks provide a process for a manager to follow when adding new employees when the focus is on innovation capability improvement. The contribution does not stop with the addition of the right person to improve innovation capability. The next step is to retain the individual until the employee has time to innovate. The thesis contributes to the current understanding of the field by proposing a framework for the evaluation of a new individual to be hired. The thesis further contributes by proposing a model that gives a manager steps to take that will aid employee retention, keeping innovation capabilities in the company until that employee can create the innovation since it takes time for innovation to happen. The above contributions will increase the understanding of innovation management.

The frameworks are limited since the frameworks are only proposed through a review of the available literature. The frameworks are a proposed method for evaluation that is combining other validated and tested methods, but the combinations of the methods have

not been tested through a survey or studies to test the validity of the combined framework. There is a limitation that some of the individual attributes and skills have been discussed, but no evaluation method was found in the literature to test. So, in the missing individual skills and attributes, the framework's suggestion to researchers and managers is to use the understanding of the skills to “inform” the selection decision of potential employees. Not providing an evaluation for every individual trait is a possible limitation since those traits have been shown by literature to be indicators of innovation.

Future work could try to reduce the number of questions that are needed in each test while still maintaining the validity and reliability of each test in the frameworks. The reduction of the questions can be accomplished by testing the framework with a survey, or other testing approaches with the complete question set and a subset proving that the validity of each of the tests and the overall frameworks has been compromised.

A limitation is that some of the individual innovative traits found in the literature do not have an evaluation method to test if present in an individual. Those individual innovative traits are given to the researcher or manager to inform the decision of whom to select in the individual selection process. Hence, another future addition would be to create an evaluation method to test more of the individual methods found through the literature review.

Further work could be done to use surveys or other study methods to test the validity of the frameworks proposed in this thesis. From those surveys, the frameworks and evaluation methods can be refined, including the possibility of reducing the number of questions needed for the frameworks to provide the same valid and reliable results.

Extending the framework to internal resources would be another future research that could be done. The thesis limited itself in research question two to external resources only, but the framework could be expanded to help companies with moving resources between job functions and teams to further improve innovation capabilities. This would further the cause for the reduction of the framework questions since a company would want to reduce the time needed for the questionnaire if the framework was used multiple times during an employee's tenure at an organization.

The framework could be tested to see how it would perform in an existing firm. The goal would be to see how well this framework would work as a predictor success in hiring and retaining individuals in the company. One suggestion is to have known innovators take the test with their teams and then see if the results correlate with the outcomes expected by the framework. This would prove or disprove the predictive validity of the framework.

Future research could help companies create a yearly employee compensation increase model based on the skills and attributes listed in Table 1 and Table 2. If evaluation methods were developed to show that an employee was increasing in the attributes or skills, then there would be additional compensation to match the increase.

The goal of the thesis was to increase understanding of how a company can effectively use hiring and retention to improve innovation capabilities. The literature review showed there is a large amount of research on company capabilities, including innovation capability. However, the literature review also showed a lack of research on how to use staffing to improve innovation capability. A framework was developed to help a company hire innovative individuals and another framework to improve employee retention. In combination, both should improve the innovation capabilities of a company.

The hiring framework will help a company add innovative employees and the retention framework to keep the employees once hired. If employees are not retained, then the hiring process will spend the effort to backfill spots vacated by employees leaving the company.

A company first needs to understand the individual who will best contribute to innovation. Research question one examined the attributes of an individual who will positively impact the innovation capabilities of a company. The model in Figure 1 was developed to improve a manager's understanding of how the company's employer brand influences the applicant pool of open positions. Next, a company needs to have the individual who will positively impact innovation to apply when a position is opened. The applicant pool is increased by increasing the employment brand image of an institution. Research question two examined the company employment brand and how it attracts individuals to apply to job openings of an organization. Once the company employment brand attracts a talented pool of individuals to a job opening, the next step is to filter down the applicants until the best candidate is hired. Research question three examined how to correctly select innovative candidates from the applicant pool to aid a company in the process of narrowing the applicant pool a framework was presented. The framework was summarized in **Error! Reference source not found.** The framework proposed a working model of how a few tests should be used in combination to improve the selection process. The framework proposed a selection method using a combination of research-validated evaluation methods into a process that will allow potential employees to be evaluated for their potential contribution to a company's innovation capabilities. The framework suggests how to evaluate a new employee to place them into a job function

where they would be best positioned to innovate. The final component of the framework was to add the employee into the best possible team using a two-part evaluation method designed for this purpose. The first part analyzes the teams already present in the company to create a team profile. The second part creates an individual profile of the employee, used in combination with the first part. The results will place the employee into the best fitting team. The evaluation framework will improve the potential of a new employee to increase a company's innovation capabilities.

The innovation capability will not be improved for long if a company loses employees who innovate, no matter how well the employee was vetted. The employee must stay with a company long enough for innovation to happen. This consideration resulted in two more research questions. The fourth research question asked what will positively impact a company's ability to retain innovative individuals. The fifth research question was about how to correctly use rewards and compensation so that retention is not negatively influenced. To help a manager with the question about employee retention, two more models were developed. The first model, **Error! Reference source not found.**, addressed retention in a way that would generally apply to all employees. The second retention model in **Error! Reference source not found.** is more specifically directed at retaining creative employees who will contribute to innovation. Retaining creative employees will improve overall innovation capabilities since innovation and creativity are linked. If a manager follows both models, they should reduce the turnover of innovative employees at a company. A company will never be able to eliminate employee's leaving since there are factors outside of a company's control like partner work relocation, family concerns, and the employee changing career directions to another

field of interest. But a company can reduce the reasons for employees quitting due to something within the company's control by making a modification to its strategies, aligning them to the models proposed in this thesis.

Even with a lack of research directed at hiring for innovation, there is associated research that can be combined into frameworks and models to improve the understanding of how to improve a company's innovation capability in the hiring process. This thesis adds to the body of work on innovation management, including research about the innovation capability of a company.

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