Agile Around the World –
How Agile Values Are Interpreted in National Cultures?

Jaakko Palokangas

University of Tampere
School of Information Sciences
Computer Science
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Supervisor: Timo Poranen
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Agile and global teamwork are currently both popular themes in software development and related research. While the agile paradigm has reported to increase the probability of success compared to traditional methods, global software development teams still face occasional problems with the agile culture adoption. This is partly because of conflicting values between agile values and certain aspects in national cultures. This MSc thesis focuses on analysing and understanding the relationships between agile and national culture values. Although there is world-wide research carried out on organisational and national culture, there has not been much research done focusing on this relationship from agile perspective. The research method followed in this study was qualitative in nature and more specifically it was a theory-dependent approach. In this research and study process, Hofstede's cultural dimensions on nations and countries were used as a basis to form a theoretical framework, within which agile values and principles were compared and contrasted. The data gathering was done through interviews, which were analysed and grouped into categories representing key characteristics in agile culture and philosophy. Based on the first interview results with cross-cultural expert, indication of the relationship between agile and national cultures could be seen. This relationship was studied in depth in interviews with team members from case projects. In addition, this research study provides some practical guidance on how agile software development principles should be adapted to fit better for example in case of high power distance cultures. This understanding is important for all software professionals working in projects with people from other countries as well for managers who need to understand consequences on their decisions when selecting where to do development.

Keywords and terms: agile values and principles, global software development, Hofstede's cultural dimensions, cross-cultural framework, national cultures

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Contents

1 INTRODUCTION

Agile and global software development are growing trends in today's software business environment. However, applying software development methods based on agile values and principles have had varying success in global software development [Paasivaara and Lassenius, 2006]. Cultural differences are often mentioned as one possible explanation why distributed agile projects fail. Hofstede and others [2011, p. 6] define culture to be *"the collective programming of the mind that distinguishes the members of one group or category of people from others"*. The purpose of this thesis has been to study the relationship between agile values and national cultures and how this relationship influences the agile methods adoption in the context of global software development. It is important to notice that this thesis does not take a stance if an organization or a company's projects should be agile or globally distributed. The thesis rather takes a stance on what should be taken into account after this decision has been made.

Siakas and others [2005] write that there are two views on managing information systems in global context. One view is stating that the managers will show similar managerial values despite the nationalities implying that the impact of organizational structures is more important than the national cultures. The opposing view says that organizations are affected by national cultures, which is stronger than converging effect of globalization. This thesis focuses on the latter view.

According to Bredillet and others [2010], management (like many other) activities are carried out by humans, and people always are driven by their values and beliefs. Since national cultures are based on values, then logically thinking management is also influenced by a culture. Bredillet, Yatim and Ruiz [2010] support that there is correlation between adoption of project management methodologies and national culture dimensions. Why agile paradigm should be different? Bredillet and others [2010] write that *"a management technique or philosophy that is appropriate in one national culture is not necessarily appropriate in another"*. This is true also with agile, what despite a strong de-emphasis on management, is still a management philosophy or philosophy of self-management to be more precise.

The same thing is noted by Newman and Nollen [1996], who state in their research study that there is no one best way to manage business. Therefore, different cultures require changes to management practices. Having multiple ways of managing different cultures does not mean that company products should vary but only their internal processes. Companies and business units that have adapted their global management practices into local cultures have resulted higher financial performance compared to those who haven't. The reason for this is that when management practices are inconsistent with deeply held values, such as national culture, employees are likely to feel dissatisfied, distracted, uncomfortable, and uncommitted having negative effect on productivity.

It is also acknowledged that other factors such as personality of team members and company culture can affect agile adoption. In fact, Iivari and Iivari [2010] summarize that agile seems to be most incompatible with hierarchical organization culture. Siakas and Siakas [2007] complement this finding by writing that democratic organisation cultures having horizontal hierarchy, leadership promoting co-ordination and flexible rules, seem to be suitable with agile values. However, for the sake of focusing and effort, only national cultures affecting on agile adoption is in the scope of this thesis. Factors like personality and company culture are kept in mind when interpreting results.

There has been some earlier research done on national cultures affecting agile adoption similar research to this MSc thesis. As mentioned above, Siakas and Siakas [2007] look agile development and national cultures from the organizational viewpoint using power distance and uncertainty dimensions in Hofstede's national culture framework but do not investigate the relationship with remaining dimensions. Vodde [2010] in turn found out that, despite the ironic name of his presentation, Scrum (methodology derived from agile values) does also work in China, if adapted correctly to their culture. This is consistent with Newman's and Nollen's findings presented above. However, Vodde's [2010] results are based on his personal interpretation of survey results, missing peer reviews and other mechanisms for ensuring academic validity. Sutharsan and Maj [2011] provide more structured research methods, although they do not reveal rationale behind their conclusions. As an example of this, they say that team consisting of different national cultures will be problematic. This thesis complements previous studies by providing transparent and repeatable research methods. It also deepens the understanding of the relationship between agile and national cultures further.

This research is based on two theories: i) values and principles behind the agile manifesto and ii) Hofstede's cultural framework. The structure of this thesis follows these theories. In Chapter 1, the motivation behind the agile movement is explained, continuing with the definitions and assumptions that support the agile methodology. This theory is then analysed in the context of global software development. After the review of agile, Hofstede's national cultural framework is introduced in Chapter 2, after which the reader achieves a basic understanding on both underlying theories. In Chapter 3, Hoftstede's cultural dimensions are compared with agile values with the help of a literature review. Based on this work, the first assumption of the relationship between agile values and cultural dimensions is created and presented in Chapter 4. With Chapter 5, that describes the research methodology, theoretical framework of this thesis is concluded.

Chapter 6 is the start of the empirical part of the thesis' research study, initiating with a cross-cultural expert's interview. The purpose of this chapter is to give a better understanding on the assumed relationship between agile values and cultural dimensions. Chapter 7 shows results from the interviews with team members in case projects. This chapter aims at deepening the understanding of this subject further and equips the readers some practical ideas how agile methods should be adapted for use within different national cultures. Conclusions in the Chapter 8 summarize the results of this thesis and offer ideas on how this research could be continued in the future.

As a summary, the main objective of this thesis is to complement and enrich existing understanding on the relationship between agile and national cultures. Additionally, it is studied how this affects the way of working in agile global software development teams. Having this understanding available, the probability of success is increased for this kind of projects and when starting new sites in foreign countries.

The specific research questions of the thesis are

- What kind of relationship there is between agile values and national cultures defined by Hofstede's cultural dimensions?
- How the possible relationships between agile and cultural dimensions affect to the way of working in agile global software development teams?

2 AGILE

This chapter describes agile in depth. After going through this, reader should have basic understanding of motivations behind the agile movement (Section 2.1 Why Agile?). Section 2.2 scopes agile for this thesis and Section 2.3 explains agile principles in general. This information is then reviewed in the context of global software delivery (Section 2.4 - Agile in Global Software Development) in order to understand setting for this thesis.

2.1 Why Agile?

A project as defined by the Project Management Body of Knowledge book [PMI, 2004, pp. 5 - 6] is *"a temporary endeavour undertaken to create a unique product, service, or result."* In the definition, temporary means that project has a defined start and end, which is reached when project's objectives have been achieved. Uniqueness means on the other hand, that even project outcome is often similar to what it has been produced before, there are always some unique factors between projects. Another characteristic of a project is progressive elaboration meaning that development is done in steps and increments. Main differentiating factors between projects and operations is "*that operations are on-going and repetitive, while projects are temporary and unique."*

Regarding project success, Standish Group defines it as on time, on budget, and with all planned features. Software development project is a complex task and it can fail on many things. Standish Group notes this in their consequent Chaos -reports, which are studying project success ratios. They report that only 16 % of projects were successful in 1994 improving slightly to 35 % on 2007 report. Almost half of the software projects were challenged in 2007, meaning that these projects had some problems with their delivery, and only 19 % projects were successful [Cerpa and Verner, 2009].

Cost of failure is high. Charette [2005] estimates in his article that alone in U.S. failed software projects caused 60 to 70 billion dollars of damage per year. He continues that in extreme cases IT projects have caused company bankruptcy. When looking for reasons behind these failures, Cerpa and Verner [2009] identify delivery date impacting on development process, project under-estimated and the lack of risk management being the

most common reasons for failures. Robert Glass [1997] complements this finding by stating that project objectives were not fully specified and bad planning and estimating are the two main reasons for runaway projects. In his opinion unstable requirements are caused by solution process complexity and the fact that in seldom there is only one best solution to choose from. On the other hand, optimistic estimations occur mainly because of misunderstanding of requirements and estimations done by people who are not doing the actual work [Glass, 2001].

Also Charette [2005] lists unrealistic or unarticulated project goals, inaccurate estimates of needed resources and badly defined system requirements to be among the most common factors for software project failures. In addition, he writes project size to be one explanation why projects do not succeed. According to him, large scale projects fail three to five times more likely than smaller projects because of greater complexity increases probability of errors when subsystems are integrated.

So it comes after all to requirements volatility that causes great share of problems in software projects. According to Rajlich [2006], there have been attempts to improve software development process by anticipating all potential changes in the future. Even if this would be possible in the first place, it only reduces changes in requirements, not solve the problem completely. Another approach according to him is using throwaway prototypes but it is a still partial solution assuming that software developers elicit all requirements during prototyping.

Clearly change of thinking has been needed and that has come in a form of agile manifesto. How do we know that agile really works in practice? In their research Sherehiy and others [2007] write that organic organizations, similar to agile organizations, are more innovative, flexible, and more capable of adapting to change. This makes these organizations more appropriate for unstable and continuously changing environments as IT projects often are. Cohn [2012] supports this assumption in his blog where he reports that according to Chaos Report 2011, agile projects were three times more likely to succeed (42 % successful) compared to traditional software projects that only 14 % were successful.

2.2 Scoping Agile for this Thesis

Iivari and Iivari [2010] write that agile is not something, that could be clearly classified because there isn't any common core idea across different methodologies (practices that implement values and principles) claiming to be agile. They continue that agile is not built-in attribute common for agile software development methodologies but an emergent property of these methods. Level of agility in turn is affected how faithfully method is followed, raising a question how this should be measured. One option according to them is to measure how strictly practices in certain methodology are followed. However, this kind of dogmatic interpretation does not allow adaptation of methodologies, which is hardly agile itself. In fact, Beck [1999, p. 129] encourages local adaptation of XP practices supporting previous conclusions.

As Iivari and Iivari [2010] conclude, agile is a vague term, having multiple meanings thus it can't be used as basis for definition. Similar analysis is done by Conboy and Fitzgerald [2004] who note that because word agile has been used in so many ways, it is impossible to reach any conclusions on that. Still, there have been several attempts to characterize agile. Even Conboy and Fitzgerald [2004], who take pessimistic stand on defining agile, do it anyway. As they see it, agile is about *flexibility* regarding changes and *simplicity* for ways of working. Sherehiy and others [2007] continue that on the enterprise level, agile means *adaptive* and flexible organizations.

Including agile methodologies into scope of analysis would lead to fragmented research missing potential commonalities between agile methods [Iivari and Iivari, 2010]. Therefore, in this master's thesis, focus was solely on *agile values* [Beck et al., 2001a] and *principles* [Beck et al., 2001b] excluding any agile methodologies such as XP or Scrum.

2.3 Introducing Agile Values and Principles

Oxford online dictionary [2013] defines value to be principle or standard of behaviour. Principle, on the other hand, is a rule or belief governing one's behaviour. Hofstede and others [2011, p. 42] complement this definition by saying that values "*are broad tendencies to prefer certain state of affairs over others*". By interpreting these definitions, we can conclude that agile values define standard of intended behaviour in the context of software development, which is guided more specifically by the set of agile principles.

As an example of this, Beck and others [2001a] define four values for better software development in their Agile Manifesto

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

In the manifesto, Beck and others acknowledge that although items on the right have some value, things on the left are more important. For example, in the case of changes, agile development promotes implementing the change while traditional software development argues that following the original plan is more important.

In order to help people to understand these values, Beck and others [2001b] introduce twelve principles behind the Agile Manifesto.

1. *Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.*
2. *Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.*
3. *Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.*
4. *Business people and developers must work together daily throughout the project.*
5. *Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.*

6. *The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.*
7. *Working software is the primary measure of progress.*
8. *Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.*
9. *Continuous attention to technical excellence and good design enhances agility.*
10. *Simplicity—the art of maximizing the amount of work not done—is essential.*
11. *The best architectures, requirements, and designs emerge from self-organizing teams.*
12. *At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour accordingly.*

Although agile principles give more details compared to the values in agile manifesto, those still leave (maybe on intention) some room for interpretation. For example who are business people and how they should work together with developers. Or what really means continuous attention to technical details?

Turk and others [2005] add that principles are based on assumptions that are premises or beliefs taken for granted and are not expected to be proven. These assumptions lead also to limitations that are restrictions and shortcomings in certain thinking. Therefore, proper use of agile requires understanding of the situations where agile is and is not applicable. If assumptions and premises behind principles do not hold, then use of the agile may not be appropriate in that specific situation.

2.4 Agile Principles Explained

There has been surprisingly little written about how agile principles should be understood. In addition to few research papers, some leads can be found from books explaining practices derived from these values. Following sections provide in-depth analysis on agile principles focusing on why certain principles exist, what those mean in practice and what are the underlying assumptions.

2.4.1 Deliver Early and Frequently

Turk and others [2005] write that the first agile principle, satisfying the customer through early and continuous delivery of software, serves to remind developers that the purpose of software development is to add value for users. Regarding early delivery we can understand that short time to market has become more important competitive advantage in IT industry especially because technology is changing so quickly. Early delivery strategy is also according to Chow and Cao [2008] the most important factor when investigating success of agile software projects in terms of scope, time and cost. This is because early releases generate revenues instead of costs. Aim for early deliveries forces also into smaller scope projects. This in turn reduces the risk of large scale projects failing more likely than smaller ones.

According to Turk and others [2005], principle about delivering working software frequently allows developers to address evolving customer needs. In other words, by giving working software frequently for end users, development team ensures that it gets feedback early in the development reducing risk of requirement volatility. On the other hand, price paid for following this principle is according to Turk and others [2005] that product scope can be unpredictable. Frequent releases ensure also that customers get response for their needs after first, sometimes incomplete, release. From the supplier perspective continuous delivery can mean good customer satisfaction or opportunity for early revenues or both.

Getting full benefits from these principles, assumes software that is equipped with user interface. Another assumption is that software can be divided into small increments that can be implemented and demonstrated in short intervals. However, in complex systems with tight dependencies between sub-systems, this assumption may not be valid [Turk et al., 2005].

2.4.2 Embrace the Change

Regarding the principle of welcome changing requirements, cost of change may not rise dramatically over time as traditionally has been thought [Beck, 1999, p. 23]. Because of this, added value for customers outweighs cost of additional changes, although there is no objective evidence that this assumption is valid in general [Turk et al., 2005]. Conboy and Fitzgerald [2004] take one step further by explaining that welcome part of the principle means that organizations do not only adapt to change, but use it as a competitive advantage. Conboy and Fitzgerald [2004] define this kind of flexibility as continuous readiness of an entity to rapidly or inherently, proactively or reactively embrace the change.

Description of the principle lefts out how agile processes harness that change. Beck [1999, p. 85], Schwaber and Beedle [2002, p. 47] describe in their books planning meetings, where release content is continuously adjusted between short development cycles. The idea behind freezing scope for certain periods, is to give possibility for developers to focus on tasks to be done next but it is still much more flexible than traditional software projects where scope is frozen in the beginning. By embracing the change, agile has an effective countermeasure against typical failures in software development projects, most notably requirements volatility.

2.4.3 Interaction and Collaboration

In the agile manifesto, there are two principles related to individuals, interactions and collaboration. First of these is highlighting the importance of different roles working together. Beck [1999, p. 81] writes that if either business or development has too much power, project will suffer. In case of business having too much power, it might specify too many requirements in given time and costs, leading to poorer quality. In contrast, if development rules, unnecessary effort can be spent on technology not giving real value for end users. Therefore, as agile proposes, business and development must work together.

According to Turk and others [2005], close collaboration between users, business and developers ensures better understanding of each other's needs, improving probability of project success. More specifically this kind of tight interaction between different parties address many of the problems reported earlier. However, this principle assumes that customer

is available for a team when developers need to interact with them. The reality is that this might not be always possible, because of customers and businesses have their own responsibilities and schedules. Likewise, possibility to have frequent and intensive communication within team is another assumption behind this principle. This assumption is difficult to fulfil in global software development, where team members are separated from each other by location, language, time-zones and culture among other things [Turk et al., 2005].

What it comes to communication between people, agile principles propose face-to-face communication over formal and precise documentation. Beck [1999, p. 29] adds that successful work throughout the project is enabled by open, honest communication, which means for example that bad news can be delivered for management without fear of punishment. Another important aspect in face-to-face communication is trust. According to Paasivaara and others [2010] this kind of communication speeds up building trust that is important for project success. In fact, Marshall and Lowther [1997] write that trust is the most important differentiator in knowledge teams' performance. Paasivaara and others [2010, p. 21] add that lack of face-to-face communication can cause misunderstandings easily in distributed projects. For example, team members close to end users may not understand to provide enough context and details for team members in other location when defining user needs. This in turn causes rework and unnecessary effort in development.

Additionally, according to Turk and others [2005] agile principles neglecting documentation as a communication aid is based on the assumption that tacit (informal) knowledge is valued over externalized (formalized) knowledge. This makes agile dependent on experts and reduces ability for organizational learning. Assuming that the code is most accurate and reliable description of what a system does and how it was designed, can be counter-productive in case of large complex systems with long life cycles, where a significant portion of the effort required on development is spent on understanding how system works. Besides, models and documentation can be used for ensuring alignment with business goals and identifying how existing enterprise systems can be used to create new services.

2.4.4 Motivation, Trust and Autonomy

When we take the fifth principle into closer look, there are two things that rise up from the text: motivation and trust. Starting with motivation, Pink [2009] says in his TED talk that good motivation thus good performance in knowledge work comes from giving autonomy to people. That is giving freedom for people to choose how they work. This is conceptually close to the agile principle of self-organizing teams resulting best architectures, requirements and designs. According to Beck [1999, p. 73], being told what to do, damages team morale easily and has effect on team productivity. The alternative according to him is that responsibility is accepted by team, not given to it. This means that team chooses if and how certain tasks are done. On the other hand, trust is important for team performance as stated in previous sections and it can be built by time and continuous informal communication. Role of the management in this setup according to Turk and others [2005] is to facilitate development process by ensuring needed resources and restraining from micro-management.

However, as Turk and others [2005] continue there are no known empirical studies that supporting this principle would lead to better results compared to traditional methods in the context of software development. In fact, this principle relies on organization capable of forming teams consisting of bright and experienced problem solvers, with solid programming skills and relevant process and product experience. Similarly, Chow and Cao [2008] found out team capability to be an important success factor for agile projects. Additionally teams should be able and willing to self-organize, which is very different from how many organizations work in reality. Therefore, if organizations expect to gain the most of agile, management of teams should be in most cases radically redesigned.

2.4.5 Simplicity

Continuous attention to technical excellence and good design increasing agility is described by Beck [1999, p. 66] who says that any given time software should run all test, have no duplicate logic, state every intention and have fewest possible classes and methods. He then adds that continuous attention to technical excellence can be achieved via refactoring, that is changing existing program to be simpler and more modifiable from its internal structure. This continuous ability and will for refactoring without destroying the structural and conceptual

integrity of the design and a product is also an underlying assumption behind this principle [Turk et al., 2005]. Therefore, only when software is testable, understandable and modifiable, changes can be implemented easily without fear of causing errors.

When investigating the simplicity principle further, Beck [1999, p. 30] proposes to treat every need or problem as it would be very simple saving unnecessary effort. He also adds that team should "travel light" meaning of carrying only few, simple and valuable artefacts. This is in line with Conboy's and Fitzgerald's [2004] description of leanness, that is according to them simplicity of tasks, information and information flow. Turk and others [2005] state that this principle is a direct response for unnecessary complexity imposed by heavyweight processes. Underlying assumption behind this principle according to them is that software is developed to respond current customer and user needs at the cost of reusability and generality. This is due to fact that building more reusable and adaptable software tend to increase system complexity and costs. On the other hand, it is very difficult if not possible to anticipate all future user needs.

2.4.6 Inspect and Adapt Based on Facts

Beck [1999, p. 82] writes that in agile team owns their development process. This ownership means that if team finds out that their process is not working properly, they are also responsible for changing it. This idea is captured in the agile principle stating that team should regularly inspect and adapt its behaviour. However, adjustment of a project requires working environment that allows flexible adaptation. If the environment is inflexible for change, this perspective of agile becomes much more difficult. Additionally it is assumed in this principle that team is collaborating frequently and is capable of self-evaluation. Teams without these characteristics have harder time in inspection and adaptation [Turk et al., 2005].

How team knows that if they have become more effective after adjusting its behaviour? Schwaber and Beedle [2002, p. 69] propose of using first-hand observations in reviews backed up with facts. What it comes to facts and measurement, agile is quite straightforward with it: *"Working software is the primary measure of progress"* [Beck et al., 2001b]. The motivation behind this principle might have come from experiences where need for control has led sometimes to level of details that really can't be measured or measures wrong things [Beck, 1999, p. 72]. Working software is an ambiguous term, which can be interpreted in

many ways. One answer for this is a definition of done that according to Panchal [2008] is ability to say when the feature or functionality is done. Definition of done is declared by team and is at minimum code committed and manually tested. Definition of done is not static meaning that it can expand over the time as team improves. This implies that meaning of working software varies between teams and also within team.

2.4.7 Sustainable Work

Cerpa and Verner [2009] write that schedule having a negative effect on team member's life is one of the reported reasons for project failures. Agile processes promote sustainable development where all people involved in software development project should be able to maintain a constant pace indefinitely. In addition to team morale, overtime poses another severe threat to project success that is errors. According to study done for nurses, risk of errors is three times bigger when they have to work longer than 12 hours per day or 40 hours a week [Roger et al., 2004]. You can imagine what figures are with knowledge intensive work such as software development.

Beck [1999, p. 68] also writes that overtime is usually symptom of some deeper problem such as inefficient processes, team doing not value adding activities or poor estimations done. If development team continues working overtime, it just hides these deeper problems without addressing real root causes.

2.4.8 Synthesis of Principles

Based on previous sections following synthesis of agile values and principles can be done. Agile values and principles promote in general:

- Concrete and early results delivered as working software.
- Flexibility by expecting and embracing change.
- Empirical approach to development based on feedback.
- Simplicity of design and processes aiming to solve current needs.
- Self-organization, autonomy and responsibility of a development team.
- Frequent and informal communication.
- Collaboration, interaction and trust between people involved.

- Continuous learning and adaptation by frequent reflection.
- Sustainability in working life.

Beck [1999, p. 29] adds also courage, quality of work, aiming for winning and small initial investment as values and principles of XP (a derivative methodology of agile values and principles). Since, these values were not mentioned in the agile manifesto, those were excluded from the synthesis above. In addition, Sutharshan and Maj [2011] describe dedicated team, risk taking, innovation, quick decision making, meeting deadlines and expectations, timekeeping, collective ownership, blame sharing, negotiation and conflict management as agile principles. However, it is not possible to see how they have come into these conclusions. Some of attributes like timekeeping and conflict management are even defined in project management basics [PMBOK, 2004] making them not specific to agile. From the reasons mentioned above these attributes were also excluded from the synthesis of agile in this study.

2.5 Agile in Global Software Development

Following sections describe motivation for global software development and how agile works in that concept.

2.5.1 Motivation behind the Global Software Development

Paasivaara and Lassenius [2006] write that Global Software Development (GSD) has become increasingly common. In fact, Conchuir and others [2009] describe that alone in U.S., offshore development market has increased 25 times in past 10 years to the point that one-quarter of software development in U.S. is predicted to go offshore.

According to Jalali and Wohlin [2010], global software development means distributed teams consisting of stakeholders with different cultural backgrounds, in distributed locations potentially also separated by time zones. Jarvenpaa and Leidner [1999] add to the definition that global virtual teams are temporary, *culturally diverse*, geographically dispersed and electronically communicating work groups. In this definition temporary means that team members of this kind of group might have never worked together before and might not expect

to work again. Culturally diverse means that work group members come from different nationalities and therefore value different things in their work. Also Conchuir and others [2009] note that *cultural differences* within GSD teams that can cause misunderstandings and conflicts. On the other hand, geographically dispersed means, that team members are physically in different locations, sometimes thousands of kilometres and several time-zones separating them, and therefore are forced to communicate mainly electronically. As Jalali and Wohlin [2010] note, major difficulties in the GSD are related with communication, personnel, culture, different time zones, trust, and knowledge management. Therefore, characteristics of GSD have significant impacts on communication, coordination and control.

The main motivator behind GSD according to Conchuir and others [2009] is typically reduced development costs. Annual salary for a software developer in U.S. is eight times higher than for a developer in India. However, looking only employment costs does not tell the whole truth. Inability to realize these potential savings based on case studies indicates that GSD environment introduces additional complexity that reduces potential benefits. For example change requests takes 2.5 times longer and tends to involve more people, when compared to co-located team. Additionally ramping up new team in off-shore can take substantial time and investment. One case company reported that it took about three months to achieve competency level, where new team could contribute to software development effort. In addition to increased complexity and ramp-up effort, offshoring process often has fear of losing jobs attached. This in turn decreases trust and team gelling between onshore and offshore team members, which have an effect on overall productivity. To sum up, potentially eight-fold savings related to GSD are often reduced because of additional complexity, ramp-up costs and lower productivity.

Forbath and others [2008] add that companies which manage their GSD other than traditional cost saving perspective can achieve better results in form of new product innovation. Seeing this kind of results and conclusion is not a surprise, considering that Forbath and others represent one of the major global outsourcing companies. In fact, Conchuir and others [2009] label this belief as a mythical benefit based on hopes that different viewpoints and backgrounds would increase innovativeness within teams. Conversely, in GSD developers have very little possibilities for sharing best practices and ideas because lack of face-to-face and informal communication between different site members. Actually, in the context of suspicion and fear of job losses, there is a very little incentive for sharing best ideas.

Other explaining factors for increased popularity of GSD are according to Hossain and others [2009] increased speed of network and increased time-to-market pressure. Fowler [2006] says that quicker time-to-market by using different time zones is a bogus argument because of communication delays between sites. His opinion is backed up by Conchuir and others [2009] who reports that companies working with diverse time-zones actually started to modify working hours so that team members could have as much overlapping time as possible. This in turn has a negative effect on personal lives of team members and violates agile principle of sustainable work. Based on these facts, Conchuir and others [2009] do not support the assumed benefit GSD decreasing time-to-market.

In addition to utilizing different time-zones, Hossain and others [2009] highlight parallel development in multiple sites, enabled by component-based architecture, another way of achieving quicker time-to-market. This assumption is partially verified by Conchuir and others [2009], although they add that this kind of modularization can create integration problems caused by the lack of communication. This risk can be mitigated by using continuous integration and loosely-coupled teams so that dependencies between onsite and offsite teams are minimized. However, loose coupling again minimizes collaboration which is important in agile. Also good understanding regarding level of granulation is important as distributing too small piece of work can cause inefficiency.

Fowler [2006] adds that another benefit of GSD is having more skilled people available. Likewise, this assumption is also highlighted by Conchuir and others [2009] in their research, reporting companies following GSD having access to workforce what they call genius employees. The disadvantage related to this assumption is higher attrition rate that is a result from rapid growth in the employment market for software developers in these countries.

Lastly Conchuir and others [2009] mention closer proximity to market and customer as a potential benefit GSD. This means that offshore sites, being closer linguistically and culturally and understanding local business conditions, would directly interact with customers. However, only one company in the research study utilised this close proximity. Conchuir and others [2009] explain low utilization of this benefit by potential socio-cultural problems amongst team members.

In summary, GSD is increasingly popular because of expected benefits of lower development costs, quicker time-to-market, availability of talented people, increased innovation and closer proximity of global markets. However, based on the examples given above, these benefits are often only partially realized some of labelled as myths. Related to the scope of this thesis, it is interesting to see cultural differences were mentioned in many articles.

2.5.2 Combining Agile into Global Software Development

According to Jalali and Wohlin [2010], Paasivaara and Lassenius [2006] and Turk and others [2005], agile values and principles have been written from a perspective of small, co-located teams having close collaboration between customers and developers. Turk and others [2005] continue that GSD is not straightforward itself and agile adds another level of the complexity into projects. Regardless this, in review of research literature, Paasivaara and Lassenius [2006] found several examples of successful combination of agile and GSD.

Iivari and Iivari [2010] note that strict interpretation of agile values and principles can lead to dead ends what it comes to global virtual teams. As an example of this, they give face to face communication. Therefore, as Turk and others propose [2005], distributed teams need to adapt agile principles in their environment. If we ignore face-to-face part in the communication, best practice for managing globally distributed teams according to Forbath and others [2008] is to design organization for collaboration and move away from command and control. Paasivaara and Lassenius [2006] support this by writing that even agile and GSD seem to be contradictory, there are combining elements between these approaches, such as promoting frequent communication between onshore and offshore development teams.

In addition of frequent communication, Paasivaara and Lassenius [2006] add that early and frequent deliveries in agile seem to suit global software development. They continue that in general benefits of agile outweigh challenges in GSD. This is mainly due to the increased visibility to project progress and offshore developers getting feedback of their work. Also learning in the agile setup is quicker than in traditional development, preventing errors to accumulate. From customer perspective seeing high quality work early and frequently and additional flexibility what it comes to changing requirements increases trust and collaboration.

In general, there have been documented successful projects using agile and global software development. Agile values promote communication thus we can assume it having positive effect on the performance of global software development teams. On the other hand, the same emphasis on collaboration can be also a pitfall for agile implementation, in case cultural and linguistic differences are too big. In global software development agile needs to be adapted at minimum to think other ways for face-to-face communication. Therefore, the role of documentation is higher in this setup than with co-located teams assumed by agile. From this study point of view, it is interesting to see that shared social norms and values were mentioned. After all what else are shared social norms and values than national and agile values.

3 NATIONAL CULTURES

In this chapter, importance of cross-cultural understanding is described in the first Section (3.1). We then continue with defining culture as Hofstede has understood it in Section 3.2. This is followed by discussion about validity and future of Hofstede's model (Section 3.3). Before going into the details of Hofstede's dimensions (Section 3.5), other multi-cultural frameworks are shortly introduced in Section 3.4. Section 3.6 about clustering countries according to Hofstede's dimensions ends this chapter.

3.1 Why Intercultural Understanding Is Important?

Trust is the most important factor for high performing knowledge teams. On the other hand, building trust requires understanding of others. Therefore, understanding other national cultures is important for a global software development teams with people from different backgrounds.

In order to understand what is the level of individual understanding on national cultural issues, Milton Bennett [1993] has created a developmental model of intercultural sensitivity. This model contains sequential steps of increased intercultural sensitivity; hence the word developmental is included in the model. Knowing this model and steps included increases self-awareness of people and help them to develop their intercultural understanding. Each of the steps is described briefly in this section.

The initial step in the path of intercultural sensitivity is *denial of differences.* Bennett [1993] writes that people in this step are not capable of seeing differences between nationalities, which is expressed as ignorant or naive observations and shallow statements of tolerance. In workplaces, forcing same management methodologies in every country and expecting that those are followed identically is one example of denial of differences. Development from this state requires embedding cultural differences in a non-threatening context and promoting an inclusive, non-blaming climate.

The next step in the developmental model is *defence against differences.* According to Bennett [1993] people start to recognize cultural differences in this step but these

observations are coupled with negative evaluation. Dualistic thinking about us versus them is typical in this step and people express their thoughts by downplaying other cultures or highlighting superiority of own. Interestingly also reversal defence against own culture is possible. Examples of this behaviour in work include positioning own country as a superior with working ethos and results when compared to other countries working in a same company. “We have to fix their errors” is a phrase that also author has heard and admittedly used by himself. It is understandable that this kind of behaviour does not mean well for spirit and performance of global development teams. Avoiding cultural contrasts, providing information about similarities, sharing needs and goals and promoting cooperative activities are ways to develop sensitivity to next step. Individually maintaining personal control, managing anxiety and having tolerance and patience are important in this stage.

Minimization of differences comes after defence stage, which as defined by Bennett [1993] means recognition and acceptance of superficial cultural differences but holding belief that deep inside every people around the world are similar. Again if we think this phase in a work context, this means that national habits and differences are accepted in a positive way but differences in values are not taken into account when working together. Development from this phase to next requires general knowledge of own and other cultures, open-mindedness, listening skills and accurate and non-judgemental perception of other cultures.

Next step in Bennett’s model is *acceptance of differences.* This means that cultural differences in people values and behaviour are recognized and appreciated and it is a beginning of ability to interpret people interactions in the cultural context. Even though curiosity is one attribute of this stage, it does not mean that people in this stage would actively change their own behaviour in situations including people from different cultures [Bennett, 1993]. The stage, coming after acceptance, is called as *adaptation to difference* and it is also the main focus of this thesis. If we understand and accept national culture differences in the context of agile software development, we can adapt our way of working accordingly and reach better results. Adaptation to differences also requires empathy, risk-taking, problem-solving, interaction management and flexibility from learners.

Integration of differences is the final step in intercultural sensitivity meaning that people in this phase are not part of any particular national culture [Bennett, 1993]. However, regarding purpose and goal of this thesis, it is enough to support people in the process of understanding and accepting cultural differences and adapting their behaviour in global development teams accordingly.

3.2 What Culture Really Means?

According to Hofstede and others [2011, p. 6] culture is a collective programming of mind for a group. To explain this, Hofstede and others are using categorization shown in Figure 1. In that, we can see that culture is something learned and specific to group. In other words, national cultures are not about individuals, but about national societies. That is also what separates culture from personality and human nature. We start with *human nature*, which is inherited and universal meaning common for every human living in the world. Some examples of human nature are ability to feel fear, anger, joy, shame and sadness.

Personality is the unique set of mental programming of individual based on set of genes inherited and modified by the culture and personal experiences. Again, if we use feelings as an example, basic feelings are ultimately defined by human nature. How we express those feelings is based on our group culture and what we have individually inherited and learned.

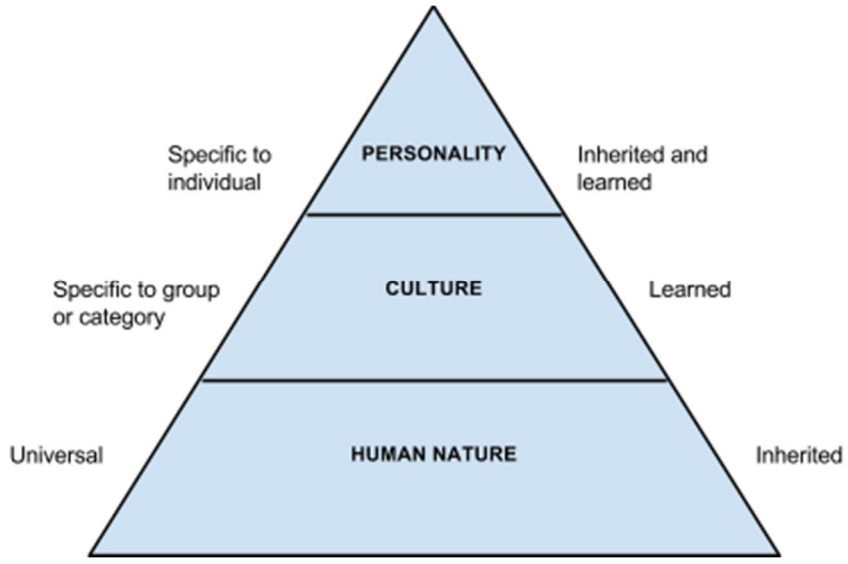

Figure 1. Three Levels of Uniqueness in Mental Programming [Hofstede et al., 2011, p. 6]

Regarding the culture, Hofstede and others [2011, pp. 8 - 9] provide deeper insight into culture with their "onion" analogy shown in Figure 2. Onion is a good metaphor for culture because culture has many layers. *Symbols* is the outer and the most visible layer. Symbols are words, gestures, pictures, status symbols shared by certain cultural group. Old symbols can be replaced very easily by new ones and copied by other groups. Therefore, symbols are also the most superficial of layers. *Heroes* are persons having characteristics highly appreciated in the culture serving also role models for behaviour. *Rituals* are activities that do not have any rational or technical purpose for desired output but are carried for their own sake reinforcing group cohesion. Typical examples of rituals are greetings and paying respects that differ from culture to culture.

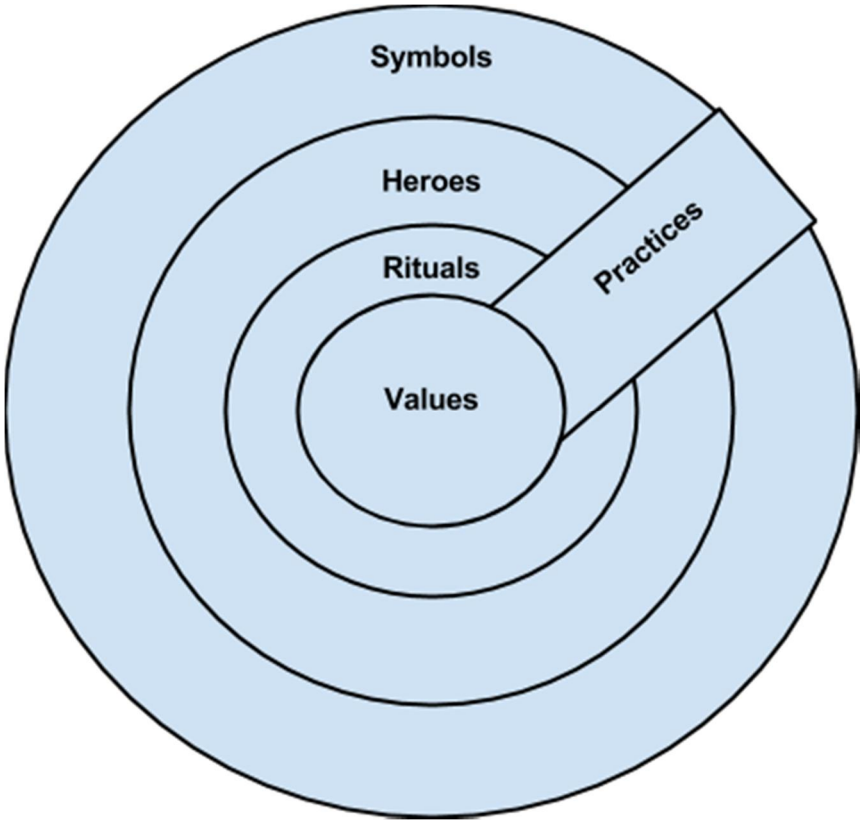

Figure 2. Manifestation of Culture at Different Levels of Depth [Hofstede et al., 2011, p. 8]

Symbols, heroes and rituals are subsumed under practices because they are visible to an outsider observer. However, cultural meaning of practices is invisible for outsiders and is dependent only in a way these practices are interpreted by the insiders. Values are core of culture. Schwartz [2012] defines that values are beliefs, which refer to desirable goals, transcend specific actions and situations. According to him, values serve as standards or

criteria and are ordered by importance relative to one another guiding action. Agile values are perfect example of this by stating for example *individuals and interactions over processes and tools* [Beck et al., 2001a].

When culture is examined from the nationality perspective, Hofstede and others [2011, pp. 22 - 23] define identity, values and institutions as sources of differences between countries. *Identity* in this definition means language and religion. *Institutions* on the other hand are rules, organizations and laws. Both of these are visible for others. In contrast, values are invisible and implicit but affect to visible institutions.

If we look both figures in the context of this thesis, we can conclude that agile methods or practices, visible for outsiders, are affected by the interpretation of values in agile manifesto. This interpretation is again influenced by national and personal values. The same thing has been noted by Siakas and Siakas [2007], who write that the agile approach can be considered to be a culture of its own. Knowing this reinforces our earlier finding that if we want to implement agile practices in global software development, we must understand underlying national and agile values.

3.3 Validity of Hofstede's model

Hofstede carried out his research over a period of 15 years and analysed some 116 000 questionnaires from 67 countries in a single multinational corporation. In this way, Hofstede concluded that differences in behaviour were due to nationality, not occupational or organizational values [Banks et al., 2005]. Since Hofstede's original IBM survey, there have been several replications of his research, which confirm and complement results of the original study [Hofstede et al., 2011, pp. 34 - 35].

Hofstede noted that his own Western culture might have influenced on questionnaires used and therefore indirectly also to results. To reduce this study bias, Michael Bond organised Chinese Value Survey conducted by his Chinese colleagues for students in 23 different countries. Results of this study yielded same four dimensions than in Hoftstede's original research thus proving again validity of cultural dimensions [Hofstede et al., 2011, p. 37].

Latest expansion of Hoftstede's framework has been Minkov's exploration of the World Values Survey [2012]. World Values Survey is a periodical survey done in ten-year intervals covering more than one hundred countries worldwide. Results of this survey are freely available for everyone as an online data bank. Using this data, Minkov extracted three dimensions correlating with Hofstede's cultural dimensions. [Hofstede et a., 2011, pp. 44 - 45]. Based on these studies, we can conclude that validity of Hofstede's model is sufficient and that framework can be used in this thesis.

3.4 Other Models of National Cultures

There are also other classifications of national cultures. Using literature survey, Shalom Schwartz collected list of fifty-six value items, which were then transformed into survey. Results of this survey were grouped to seven dimensions called: conservatism, hierarchy, mastery, affective autonomy, intellectual autonomy, egalitarian commitment and harmony. These values significantly correlate with Hofstede's individualism -dimension [Hofstede et al., 2011, pp. 40 - 41]. However, Schwartz [2012, p. 265] research covers many life domains while Hofstede's items refers to work life. In other words, Hofstede's dimensions are more suitable for the scope of this thesis.

Other large-scale analysis in this area has been GLOBE project by Robert House, which expands Hofstede's original five dimensions into nine dimensions. More specifically, this model keeps power distance and uncertainty avoidance, splits collectivism into institutional collectivism and in-group collectivism, changes masculinity into assertiveness and gender egalitarianism, renames long-term orientation to future orientation and adds humane and performance orientation. Although GLOBE replicated results of Hofstede's original research, Hofstede criticizes this survey having too much research jargon used in questionnaires [Hofstede et al., 2011, pp. 41 - 42].

In the area of national culture classifications, Fons Trompenaars is also often mentioned. His model distinguishes seven dimensions that are: universalism versus particularism, individualism versus collectivism, affectivity versus neutrality, specific versus diffuseness, achievement versus ascription, time orientation, and relation to nature. Hofstede and others [2011, p. 43] note that these dimensions have been taken from conceptual distinctions, not

specifically for describing countries. Another limitation of Trompenaars' classification is that it has no peer-reviewed academic publications reducing its validity.

3.5 Cultural Dimensions Defined

This section introduces Hofstede's cultural dimensions. Before going into details, it should be defined what is meant with dimension in Hofstede's model. Dimension groups together a number of phenomena in a society that are empirically found to occur in combination. The grouping of different aspects of a dimension is always based on statistical relationship. The scores for each country on one dimension can be pictured as points along a line representing *relative, not absolute,* positions of countries [Hofstede et al., 2011, p. 31 and 56].

3.5.1 Power Distance

Hofstede and others [2011, p. 61] define power distance (PDI) as *"the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally"*. Institutions in this definition mean basic elements of society such as schools, families and communities and organizations places where people work.

Hofstede and others [2010, p. 76] describe key differences in this dimension in the workplaces by saying that hierarchy for small power distance societies mean convenience, while in higher power distance hierarchy is existential inequality between levels. This is expressed in privileges and status symbols that are disliked in small power distance countries. Organizations in countries with small power distance have more decentralization, fewer supervisory personnel and narrower salary range compared to workplaces in large power distances. They continue that in small power distance countries managers rely on their own and on subordinates' experiences while in higher power distance countries managers follow their superiors and formal procedures.

On the other hand, subordinates expect to be consulted in cultures with small power distance, while in higher power distance societies subordinates expect to be told what to do. Therefore, the ideal boss in small power distance countries is a resourceful democrat with pragmatic

relation to subordinates. This is quite different from the ideal boss in high power distance countries, who is benevolent autocrat with emotional relations subordinates.

One interesting finding is that occupation and education affect to power distance. Members with highest occupation and education level report lowest power distance regardless the nationality, compared with people having lower occupational and educational level. This can be explained by that people high in hierarchy do not "see" power distance as people lower in the society hierarchy. Differences in this dimensions related to respondent's occupation, are largest in lower power distance countries, while being relatively small in high power distance countries. Therefore, the values of high-status employees with regard to inequality seem to depend strongly on nationality. [Hofstede et al., 2011, pp. 65 - 66].

3.5.2 Individualism

Hofstede and others [2010, p. 92] define individualism (IDV) as follows: "*Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or immediate family. Collectivism as its opposite pertains societies in which people from birth onward are integrated into strong, chosen in-group, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty*".

Related to work, individualism relates to importance of having job that leaves sufficient time for personal or family life, freedom to adopt own approach to the job and getting personal sense of accomplishment from work. For the opposite, collectivist culture prefer having training opportunities to learn new skills, good physical working conditions and possibility to fully use own skills and abilities on the job. Workers in individualistic cultures are expected to act according to their own interests, and work should be organized in such way that personal and employer needs coincide. This is also related to goal setting and rewarding. Workers in highly individualistic countries perform better when having individual goals and recognition based on those in contrast to employees in collective cultures [Hofstede et al., 2010, pp. 92 - 93, 119, 121].

Regarding collaboration, the personal relationship prevails over the task and should be established first in collective societies. Countries with high individualism prefer high frequency, low-context and direct communication where speaking one's mind is considered a virtue. Even confrontation is salutary in these countries since it is believed to lead to a higher truth, conversely to highly collectivistic cultures where confrontation is avoided. Personals opinions do not exist in countries with high collectivism but are predetermined by the group. This is expressed so that people hesitate to speak up in larger groups [Hofstede et al., 2010, pp. 106 - 107, 118].

Hofstede and others [2010, pp. 102 - 104] present also that individualism and power distance tend to be negatively correlated. Countries with large power distance tend to be more collectivist because in these cultures people are dependent on in-groups and power figures in those, represented typically by head of families. On the contrary, in individual cultures where people are less dependent on in-groups, they are also less dependent on powerful others.

3.5.3 Masculinity

Masculinity (MAS) as defined by Hofstede and others [2010, p. 140] is as follows: "*a society is called masculine when emotional gender roles are clearly distinct: men are supported to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life*". They continue that *a society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life.*

According to Hofstede and others [2010, p. 146], in country level masculinity dimension gets easily confused with individualism. However, both dimensions are independent from each other. Individualism-collectivism is about independence or dependence of in-groups, while masculinity-femininity focuses on ego versus relationship with others.

Hofstede and others [2010, p. 139] characterise masculinity with words like assertive, competitive and tough, while femininity is associated with tenderness. In work having opportunity for high earnings, getting recognition when doing a good job, having possibilities for advancement and challenging assignments are important goals in masculine cultures.

Maybe this is also the reason why masculine cultures prefer larger organizations than feminine cultures. In addition, feminine cultures appreciate having good relationship with superior, cooperation with other people and employment security. In a work - life balance masculine cultures tend to be more work oriented, while feminine cultures consider often private life more important.

Hofstede and others [2010, pp. 161, 170] continue that in masculine cultures, failing in school (and likewise in work) is a disaster, while in feminine cultures it is a relatively minor incident. Competition is important in masculine cultures and aggression can be expressed openly. Conflicting interests are resolved by letting the strongest win in masculine cultures, in contrast to feminine cultures where conflicts are resolved by compromise and negotiation.

Regarding management, Hofstede and others [2010, pp. 166 - 167] write that management is an Anglo-Saxon concept developed in masculine countries. For more masculine cultures it is often associated with initiating structure and concern for work, while in feminine cultures it stresses on consideration and concern for people. This can be seen also in job improvement that means more opportunities for mutual help and social contacts in feminine cultures but adding more and demanding tasks in masculine cultures [Hofstede et al., p. 169].

3.5.4 Uncertainty Avoidance

Definition of uncertainty avoidance (UAI) is *the extent to which the members of a culture feel threatened by ambiguous or unknown situations.* This feeling is expressed through stress and a need for written and unwritten rules. Uncertainty avoidance should not be confused with risk avoidance. Risk has object and some probability to occur, while uncertainty avoidance is an overall feeling with no probability attached. Instead of mitigating risk to occur or its consequences, uncertainty avoidance focuses on removing ambiguity. Therefore, it can be concluded that uncertainty avoidance is mostly about interpretability and predictability of organizations, institutions and relationships [Hofstede et al., 2010, pp. 191, 197 - 198].

Uncertainty avoidance is correlated with anxiety, which is a state of being uneasy or worried about what may happen. Anxious cultures tend to be expressive cultures meaning that emotions, good and bad, are shown openly. People from high uncertainty avoidance countries

also have reported to have more hostility, depression, self-consciousness and vulnerability and less trust, straightforwardness, altruism, compliance, modesty and tender-mindedness [Hofstede et al., 2010, pp. 195 - 197].

Uncertainty is avoided by generating strong systems or rules and norms, which in turn increase interpretability and predictability. However, these rules also decrease flexibility. There is aim for one truth in countries with higher uncertainty avoidance, while in weak uncertainty avoidance countries different truths, opinions and modes depending of the situation are accepted and tolerated. The concept of truth is related to expertise, where teachers or specialists of certain subjects are expected to have all the answers in high uncertainty avoidance countries. In lower uncertainty avoidance culture, "I don't know" is accepted as an answer [Hofstede et al., 2010, pp. 201 - 206].

Hofstede and others [2010, p. 209] write that in the workplace, high uncertainty avoidance is related to need for long-term employment and lower ability to cope with organizational restructuring. In these cultures, there are also more internal regulations and processes to control the work, although this need is replaced in some extent by supervisors' authority in high power distance countries. The need for rules in high uncertainty avoidance countries is emotional and can even produce rules that are not necessary for the sake of outcome. However, these rules are important in these countries, since those provide emotional safety for employees. The paradox in rules is that even there are lot of rules in high uncertainty avoidance countries those are less strictly followed than rules in low uncertainty avoidance countries. In other words, low uncertainty countries have fewer rules but those are followed more strictly.

According to Hofstede and others [2010, pp. 211 - 213] innovation is linked with uncertainty avoidance. Rules and regulations that are common in strong uncertainty avoidance countries, constrain often out-of-the-box thinking that is required in innovation process. Innovation has also another side that is implementing innovations into ready products and services. This phase requires more sense of detail and punctuality and these aspects countries with higher uncertainty avoidance excel.

Motivation is another aspect indirectly linked with uncertainty avoidance. Hoftstede and others [2010, pp. 213 - 216] could not identify clear relationship with motivation and uncertainty avoidance but when they added also masculinity dimension, picture came clearer. Low uncertainty avoidance combined with high masculinity means willingness to run unfamiliar risks and importance of visible results. This kind of behaviour is typical for cultures motivated by achievement. When looking at feminine cultures with weak uncertainty avoidance, achievement is still important but human relationships prevail over esteem. In high uncertainty avoidance countries, safety or security is more important than achievement but emphasis on human relationships or esteem depends again on country masculinity dimension.

3.5.5 Long-Term Orientation

Long-term orientation stands for "*the fostering of virtues oriented toward future rewards - in particular, perseverance and thrift*". Its opposite, "*short-term orientation stands for the fostering of virtues related to the past and present - in particular, respect for tradition, preservation of "face", and fulfilling social obligations"* [Hofstede et al., 2010, p. 239]

Related to business and way of thinking, main values in short-term oriented societies include freedom, rights, achievement, and thinking of oneself, whereas in long-term oriented countries these values are learning, honesty, adaptiveness, accountability, and self-discipline. In long-term oriented societies wide differences in economic and social conditions are undesirable. On the contrary, short-term oriented societies stand for differentiation according to abilities and rewarding for those. People in short-term oriented societies are more often analytical thinkers focusing on elements, while in long-term societies thinking focuses on overall systems. Considering problem solving, long-term oriented countries are more concerned with what works, rather than why it works [Hofstede et al., 2010, pp. 251, 262].

3.5.6 The Future of Hofstede's Dimensions

It has been questioned if Hofstede's framework is still valid almost 50 years after the original survey? Hofstede and others [2010, p. 87] address this by stating that in case of power distance, although impressionistically dependence on power has reduced globally,

globalization and unequal distribution of wealth seem to have increased power distance. However, since Hofstede's cultural dimensions describe relative differences between countries and those differences have not been changed significantly. Hofstede and others continue: *"Nobody, as far as we know, has offered evidence of a convergence of countries towards smaller differences in power distances"*.

Related to other cultural dimensions, Hofstede and others [2010, pp. 134 and 184 - 185] describe positive correlation between individualism and femininity and the wealth of the country. This means as wealth increases, more individual and feminine values prevails in the society. As wealth has increased globally, the relative differences between countries remain intact. Uncertainty avoidance has not been measured over longer time periods, but according to some studies this dimension is fluctuating between periods of time. This fluctuation is expressed in extreme situation as war. After the war reconstructing is started lowering the anxiety and increasing tolerance but this trend is reversed again after some period of time [Hofstede et al., 2010, p. 233].

3.6 Clustering Countries

In order to make Hofstede's five dimensions more visible and tangible for readers, Banks and others [2005] have grouped countries into six clusters linked with certain mental image. Next sections below explain these clusters in more details.

3.6.1 Contest

Banks and others [2005] define cultural dimensions common for Contest countries to be low power distance, high individualism, low uncertainty avoidance and high masculinity. Contest Countries are represented by Anglo-Saxon countries with some former British colonies approaching it.

Typical values for countries in this cluster are competition and freedom. The race for happy and successful living is open for members of these countries. Government role is to stay back and ensure fair rules with as minimal regulation as possible. People are motivated by fixed and quantitatively measurable targets and public recognition by others. What it comes to

communication, open discussion regardless the position in hierarchy is accepted and even conflicts do not disrupt work relations. These countries do not tend to focus on details but rather on big picture supported by planning systems, which aim at the overall objectives [Banks et al., 2005].

3.6.2 The Network

The Network cluster, comprising Scandinavian countries and the Netherlands, has low power distance and high individualism in similar with Contest countries. The main difference between these two clusters is masculinity, which is significantly lower in the Network cluster. The Network countries prefer cooperation, consensus and friendly relations. People in this cluster are motivated by the feeling of contribution to their community and being recognized by this. They also expect to be heard especially on issues affecting on them directly. This means for managers that their role is to coordinate and facilitate rather than command and control. The mission of the company (or development project in this context) is not only short term profit but also welfare of employees and reliability [Banks et al., 2005].

3.6.3 The Family

Countries (China, Hong Kong, India, Indonesia, Malaysia, Philippines and Singapore) in the Family cluster have high power distance, low individualism and low uncertainty avoidance in common. The key words for this cluster are harmony and change. This means in practice, that employees in these countries feel obligation to their companies and leaders but not so much for the rules. As a result, projects or business operations are implemented quickly. Formal procedures may exist in great lengths but do not apply in specific situations and can always change. Building trust may take time but lasts once it is there. For employees it is necessary to make them feel like a part of family their leader being father -like figure. Harmonious relations are very important meaning negative feedback is avoided especially in public. Therefore, people from this cluster communicate implicitly and indirectly [Banks et al., 2005].

3.6.4 Pyramid

Pyramid countries, such as Portugal, the Russian Federation, Greece, Korea, Bangladesh, Pakistan and most African and Arab countries and Latin America, share high power distance, low individualism and high uncertainty avoidance. The Pyramid provides clear structure for its members what it comes to hierarchy, mandate and processes. Power is unequally divided in these countries, which is also accepted. Therefore, management style is based on authority at the top of pyramid and it is supposed to oversee everything and set out policies for the common good. This means that good leader in these countries is visible and has personal prestige combined with power. Open discussion about company policies or decision-making is not tolerated although leader can answer all questions and delegate mandates in a structured way [Banks et al., 2005].

3.6.5 Solar System

The Solar System has many similarities with the Pyramid meaning high power distance and uncertainty avoidance. However, high individualism is dimension that differentiates countries in Solar System cluster from Pyramid countries. As in Pyramid, also countries in this cluster have clear hierarchy and structure in their organizations but members being highly individuals do not feel loyal to the company. Instead people are more tightly connected with their professional, academic peer group or department making coordination much more difficult than in Pyramid countries [Banks et al., 2005].

People in this cluster have an intrinsic motivation to do a good job according to their professional standards. Not surprisingly honour is one key word that can be used to describe this cluster. Managers are visible persons who are feared and respected at the same time. However, they should exercise their control in subtle way in order avoid de-motivating people who take pride and honour in their work. This concern also conflict management where manager is only supposed to intervene if conflicts threatens to get out of hand. This discrepancy between respect for the authorities and self-realisation is the dilemma in Solar System countries. Solar System countries are represented by France, Belgium, Northern Italy and to limited extend Argentina and Spain [Banks et al., 2005].

3.6.6 The Well-Oiled Machine

The characteristics of Well-Oiled Machine countries are low power distance and high uncertainty avoidance. German -speaking countries, and in some extent Hungary and Czech belong into this cluster. Like in Solar System, also people in Well-Oiled Machine countries face dilemma with requiring structure and predictability but not accepting authority imposing such structure. Solution to this dilemma is to divide power so that it is on everybody responsibility to create such systems and to maintain them. People in these countries require rules to be objective and fair and information flowing freely. Leaders of these people should have convincing power through facts and their role is to be one of the experts intervening only as a last resort. Autonomy of employees is important and control can be experienced as demotivating. In general managers can rely on their people to perform punctually and as specified. Emphasis in this cluster is on systems, structure and objectivity with lot of transparency [Banks et al., 2005].

4 ASSUMED RELATIONSHIP BETWEEN AGILE AND NATIONAL CULTURES

After introducing agile values and Hofstede's cultural dimensions, we start to have enough information to analyse the first research question that is: What kind of relationship there is between agile values and national cultures defined by Hofstede's cultural dimensions? This chapter reveals first assumptions related to the relationship between agile values and Hofstede's cultural dimensions.

4.1 Self-Organization and Power Distance

Newman and Nollen [1996] write that in low power distance countries more participative work units will be higher performing than less participative work units. Related to this, in low power distance countries employees expect consulted on work and decisions related to them, while in high power distance countries good manager tells employees what to do. When we know based that agile values promote collaboration that is close to participative management, first indication of the relationship between agile values and low power distance was identified.

Paasivaara and Lassenius [2006] continue that in order to change from traditional command and control model towards more agile, development teams need to be more self-organized and empowered referring to delegation and distributed decision making. According to Fowler [2006] this can be a potential conflict in cultures that reinforce deference to superiors. Therefore, teams and individuals showing self-initiative take time in these cultures.

Also Sutharshan and Maj [2011] identify relationship between power distance and agile principles. They write that power distance dimension has relationship with trusting people more than processes, transparency, authority, quick decision making, empowering people, proactiveness, management support, collective ownership, blame sharing, negotiation and conflict resolution. While we can agree with some of these characteristics, Sutharshan and Maj do not reveal how they have come into these conclusions. In addition, they miss what is the direction of this relationship. For example, how quick decision making is linked to power distance? Is it typical in cultures with high power distance or vice versa? Sutharshan and Maj [2011] also exclude how their findings relate to agile values. For example on what basis

blame sharing is agile specific principle? There can't be found any references about blame sharing in agile values or principles.

Another aspect to power distance and agile comes in form of agile value manifesting the *"Customer collaboration over contract negotiation"* [Beck et al., 2001a]. Traditionally it has seen that customer is higher in the hierarchy compared with supplier. However, in this agile principle collaboration is proposed. This again refers to more equal stance between parties. Similar, more equal relationship can be seen in agile principle stating *"Business people and developers must work together daily throughout the project."*

Based on this, we can conclude that agile values seem to favour low power distance. This is mostly because of self-organization, empowerment and collaborative management style highlighted in agile.

4.2 Individuals and Interactions

The first agile value is stating *"Individuals and interactions over processes and tools"* [Beck et al., 2001a]. This clearly promotes individualistic values although, also interactions (a feminine value) are mentioned and processes downplayed (a sign of low uncertainty avoidance). Individuals are again mentioned in the agile principle proposing *"Build projects around motivated individuals"* [Beck et al., 2001b]. Based on this, it seems that agile leans on individualistic values.

Newman and Nollen [1996] continue that in individualistic countries performance of team is higher if individual responsibility is emphasized. In contrast, teams in collectivist countries are performing better if individual goals are not emphasized. This is in line with Hofstede's results. However, agile values or principles do not mention directly if goals should be set for individuals or for the group. We can get only hint from agile principle starting with "*our highest priority"* which seems to refer to group goals and therefore collectivistic values.

In the individual cultures, freedom to adopt own way of working is appreciated. This approach is supported by agile principles proposing that *"The best architectures, requirements, and designs emerge from self-organizing teams"* and *"At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour accordingly"* [Beck et al., 2001b]. It can be also argued that this could refer for collectivist values since team is in-group of its own kind.

Regarding communication, individualistic countries prefer direct communication. This type of communication is represented by face-to-face communication in agile principles, although the internet and email hold strong appeal for individualistic cultures according to Hofstede and others [2010, p. 124].

As a conclusion, it is more difficult to identify at this point if agile values favour individualistic or collective values than in case of power distance where the relationship was more evident. Agile values and principles talk about individuals and values related to individualism but those are often described from the viewpoint of the team, which points towards collectivism.

4.3 Goal Setting and Sustainability

Masculine cultures prefer having clear and tangible goals. This can be seen in agile value of *"Working software over comprehensive documentation"* [Beck et al., 2001a], which is repeated in agile principle about *"Working software is the primary measure of progress"* [Beck et al., 2001b]. The latter principle has also hints of low uncertainty avoidance. In addition, agile principles define that *"Our highest priority is to satisfy the customer through early and continuous delivery of valuable software"* and *"Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale"*. Therefore, these principles correspond with clear goals and achievement.

What it comes to change, feminine cultures accept better changing objectives and goals than masculine cultures. Change is often mentioned in agile starting with value stating *"Responding the change, over following the plan"* [Beck et al., 2001a] and *"Welcome changing requirements, even late in development. Agile processes harness change for the*

customer's competitive advantage" [Beck et al., 2001b]. First impression based on these statements is that this part of agile is related to feminine values but those can be also relate to uncertainty avoidance and masculinity regarding the latter statement and phrase competitive advantage. In fact, these statements can be also seen as an attempt from masculine culture to adapt with changes often coming in software development projects.

"Customer collaboration over the contract negotiation" [Beck et al., 2001a] and "*Business people and developers must work together daily throughout the project"* [Beck et al., 2001b] refer to looking for consensus over competition, which is a feminine value. Also *"Individuals and interactions"* [Beck et al., 2001a] stresses the importance of relationships again being feminine value. In feminine cultures people work in order to live and leisure time is preferred over work. This is highlighted in *agile processes promote sustainable development* -principle, although we can't be sure about motivations behind that principle. Is it done based on values or facts that overtime causes more errors and costs?

As in individualism, also in this dimension there are agile values and principles that favour masculinity (clear goals and achievement) but also femininity (accepting changing goals, sustainability, working together). Therefore, at this point it was not possible to draw any other conclusions on the relationship between agile and individualism.

4.4 Rules, Regulations and Changes

Regarding uncertainty avoidance, Newman and Nollen [1996] found out that countries with low uncertainty work related performance is better if rules and directions are not well-defined. When we investigate agile values and principles, we can find several examples favouring less definition and documentation such as: *"Individuals and interactions over processes and tools", "Working software over comprehensive documentation"* [Beck et al., 2001a], *"The most efficient and effective method of conveying information to and within a development team is face-to-face conversation"* and *"Working software is the primary measure of progress"* [Beck et al., 2001b]. To elaborate this more, interactions over processes, face-to-face conversation and working software mean less formal definition and documentation on what and how work should be done and followed. This conclusion is reinforced with principle of *"Simplicity--the art of maximizing the amount of work not done--*

is essential" [Beck et al., 2001b]. Cultures avoiding uncertainty tend to make unnecessary rules and regulations in order to provide emotional security for its members.

Another important concept related to uncertainty avoidance and agile is change. Related to change following agile principles can be highlighted: *"Responding to change over following a plan"* [Beck et al., 2001a] and *"Welcome changing requirements, even late in the development"* [Beck et al., 2001b]. Low uncertainty avoidance cultures see change as an interesting possibility, but for high uncertainty avoidance cultures change is something that should be avoided.

Based on above, we can see clear relationship between agile values and low uncertainty avoidance. Only exception to this is *"Continuous attention to technical excellence and good design enhances agility"* [Beck et al., 2001b]. Detail-oriented work is common in cultures with high uncertainty avoidance.

4.5 Long-Term Orientation

Related to the long-term orientation -dimension the first *"Our highest priority is to satisfy the customer through early and continuous delivery of valuable software"* and third principle *"Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter time scale"* [Beck et al., 2001b] quite straightforward prefer short-term orientation. However, if we look at *"Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely"* [Beck et al., 2001b] it implies the importance of long-term aspect in agile development. On the other hand, same principle can be interpreted from the perspective of leisure time, which is more important in short-term oriented societies. The assumption based on these principles is that agile favours short-term orientation.

4.6 Summary of Assumptions

Purpose of this section was to summarise assumptions so far. Based on comparing literature with agile values and principles, we could see indications that agile favours *low power distance* because of self-organization, empowerment and delegation of power, *low uncertainty* avoidance because of emphasis on less definitions and accepting change, and *short-term orientation* due to preference of early deliveries. This is close to findings from Siakas and Siakas [2007] who write that agile works best in organization cultures with low power distance and uncertainty avoidance.

Relationship with *individualism and collectivism remains unclear* because agile points for both individualism (individuals mentioned, freedom to adapt own way of working, direct communication style) and collectivism (team effort). Likewise, relationship with *masculinity dimension is also unclear* because goal setting is geared towards masculine values but on the other hand, changing goals and collaboration are feminine values.

5 RESEARCH METHODS

Section 5.1 describes used research approach in thesis. This is followed by sections about research validity (Section 5.2) and data collection (Section 5.3). This chapter ends with the Section 5.4 about data analysis.

5.1 Qualitative Research Approach

In this thesis qualitative research and more specifically theory-dependent approach was used. This according to Tuomi and Sarajärvi [2002, pp. 98 - 99] means that previous knowledge of the subject guides research and analysis. In practice, assumptions behind the theoretical framework are first introduced. Collected data is then analysed based on the data itself but in the end of the analysis, data is linked with the theoretical framework. Therefore, analysis follows abductive logic, in which collected data and theory are influencing each other in researcher's thinking process sometimes generating new insights. For example, theory affects how interview questions are defined, which affects again to gathered data and theory.

Interviews were used as a main research method in this study. The main reason for using interviews was that, according to Tuomi and Sarajärvi [2002, pp. 75 - 76] interviews are flexible. Interviewer has possibility to repeat and clarify questions thus reducing possibility of misunderstandings and false data. Additionally interviewer can act as an observer noting not only what is said but also how it is said. Regarding amount of interviews to be done, Tuomi and Sarajärvi [2002, p. 87] write that sample size and amount of interviews in master's thesis -level research is less relevant than the quality and depth of interpretations. This is emphasized in qualitative research, where statistically valid conclusions are not a goal of research but understanding certain behaviour or giving meaningful interpretation for it.

In the qualitative research it is also important that people who are interviewed have lot of knowledge and experience around given subject. Selecting right interviewees and data should be done with careful consideration and with enough transparency so that reader can decide scientific validity of results. In this thesis both *elite* and *convenience sampling* were used. Elite sampling as described by Tuomi and Sarajärvi [2002, p. 88] means that selected interviewees are persons who have very good knowledge about study subject and are capable

of expressing it understandably. Cross-cultural expert represented elite sampling in this thesis. In the convenience sampling, there is bigger tolerance for what it comes to selecting people for interviews. For the team member interviews, respondents did not need to have an expert understanding on agile. It was enough if they had some experience of global software development, were able to express that understandably and most importantly, were available for interviews.

Interviews in this thesis were divided into two phases, which differ by purpose, interview type, and knowledge of interviewee. Cross-cultural expert interview was done first in order to get better understanding on research questions and derive further questions for following team member interviews.

5.2 Research Validity

According to Tuomi and Sarajärvi [2002, pp. 132 - 133] there are four different theories about truth in research, each having own viewpoint. According to *correspondence* theory, claim is true only if it reflects reality. *Coherence* theory defines truth to be something what is reached when claim is consistent with other claims. *Pragmatic* theory on the other hand, is related to practical consequences and stresses that belief is true if it works and is useful. In the *consensus* theory the definition of truth is based on common understanding of people. Qualitative research and also this research, focuses on pragmatic and consensus theories about truth, although it can't exclude coherence theory either.

When discussing about research objectivity, Tuomi and Sarajärvi [2002, p. 133] differentiate *validity of observations* and *research bias.* Research bias means that the interpretation of observations is affected by researcher's personal background such as sex, age, religion, political influence, *nationality,* status etc. In qualitative research, this kind of bias is inevitable because researcher is often single person who creates setup for the research and interprets results. One example of this bias is the situation, where Hofstede assumed his Western background affecting on question setting. His resolution for this was to repeat national values survey with questions done by Chinese researchers. In this research, nationality was also assumed to cause research bias. However, using other researchers with different background was not possible in this research due to the nature of master's thesis.

This bias was reduced in question setting by using predefined statements (agile values and principles) and as neutral keywords as possible.

Also researcher being involved in the research domain affects to research bias. Nurse investigating patients' experiences from treatment is one example of this kind of bias. Likewise, author was involved in some case projects as a project manager and that may have caused bias in the interpretation and analysis phase. This bias was reduced by selecting also other case projects where author has not been involved. Also peer reviews, not only limited to master's thesis supervisor, were used extensively throughout this research to reduce the research bias.

Related to the quality and objectivity of research Tuomi and Sarajärvi [2002, pp. 133 - 135] define concepts of *validity* and *reliability*. Validity means that in the research it has been studied what it has been promised. Reliability on the other hand is that results from the research can be repeated. Reliability and validity in the research can be achieved by understanding what and why is said in the research, understanding researcher's own relationship on the research topic and how it has changed during the progress. In addition, data collection and analysis, respondent selection and how results are reported affects to reliability and validity.

According to Tuomi and Sarajärvi [2002, pp. 140 - 141] *triangulation* can be used to increase the reliability of qualitative research. Triangulation in simplest definition means combining different methods, researchers, sources of data and theories in a research. As mentioned earlier, other researchers can't be used in making of master's thesis but two types of interviews, respondent's with different backgrounds and different viewpoints on agile were used as a triangulation mechanism and enriching understanding on the subject in *a tradition of postmodern research.*

5.3 Data Collection

Data collection was done in two phases, with different focus areas, interviewee profiles and interview methods. Purpose of the first phase was to get preliminary results and better understanding on the relationship between agile and cultural dimensions answering for the

first research question: *what kind of relationship there is between agile values and Hofstede's cultural dimensions?* Therefore, in this phase respondent was expert on cross-cultural issues. Interview itself was based on predefined agile values and principles.

First phase helped in the next round of team member interviews, which focused on getting more data from agile "users" relating to theory created based on literature and the first phase interview. Another important aspect of this phase was to get answers for the second research question that is *how the possible relationships between agile and cultural dimensions affect to the way of working in agile global software development teams?* Different purpose of the second phase meant that respondents were software development professionals from different nationalities having some knowledge about agile but not necessarily about Hofstede's cross-cultural dimensions. The latter was important since spontaneous reaction related to values and keywords indicating deep beliefs, was looked from these interviews.

5.3.1 Form-Based Interview

Form-based interview was used cross-cultural expert interview for validating research questions as proposed by Tuomi and Sarajärvi [2002, p. 77]. In this kind of interviews predefined questions are asked in a certain order. Form-based interviews are also very focused having only questions meaningful for study objectives. This means that every question must be related to what is known from subject before.

Form-based interview in this research was based on agile values and principles, which were reviewed with respondent one by one. Interviewer role was to explain what certain agile values and principles meant. Respondent was a cross-cultural expert, who had deep knowledge on Hofstede's cultural dimensions. As a consequence, she had needed knowledge to identify possible relationship between agile and cultural dimensions and could provide increased understanding on research questions. Questions used in the form-based interview can be found from the Appendix 1.

5.3.2 Semi-Structured Interviews

Semi-structured interviews emphasize respondents' interpretation around defined subject and therefore are suitable method for this kind of research. Semi-structured interviews were conducted based on pre-defined keywords, which were supported by clarifying questions. It is debatable if questions and order of questions between interviews should remain the same [Tuomi and Sarajärvi, 2002, p. 77]. In this thesis iterative approach was chosen meaning that questions could be changed based on learning from earlier interviews. It was understood that this violated the principle of conformity but benefit of more accurate questions thus getting better data was higher. Because national cultures are combination of common beliefs and values, deep inside our behaviour, not a result of analytical and structural thinking process, it was decided not to give questions beforehand for the interviewees. In other words, spontaneous reaction for questions was aim for these interviews.

Following principle of small sample size and focus on interpretation, interviews in this phase were initially planned for few members of selected nationalities only. More interviews were done based on schedule, effort and outcome of first interviews. This approach is defined by Sarajärvi and Tuomi [2002, p. 89] as a *saturation* meaning that additional interviews should give new insights to the topic and when that does not happen it means that enough samples and data is collected.

Roles selected for the interviews were people who had worked directly with projects (more specifically project managers, team leads and developers). This was done because success of software development is often measured via projects and that is mostly affected by these people. Managers and support functions not directly working in projects were excluded for the same reason.

All interviewees in this phase were selected on the basis of working in globally distributed agile projects. Selecting different nationalities from the same project was important in order to get different viewpoints on agile implementation on the project level. It would have been interesting to interview also distributed project teams using traditional methods in order to see how strong is agile influence compared to national values. That idea had to be given up on the basis that agile was at least claimed to be followed in most of projects in case organization.

5.3.3 Questions in Project Member Interviews

Since interviews were done for software development professionals with tight time pressure from development projects, minimum viable set of questions was aimed for. Schwartz [2012, p. 264] points out that when asking questions related to values, those are often focused on beliefs, desirable goals and standards being sometime contradictory to the transcended nature of values. Situation-specific questions are therefore highly sensitive to prevailing conditions and responses presumed to measure the same underlying value might vary with a change in conditions. This in turn loses basic, trans-situational value orientations. An example of this given by Schwartz is that substituting *"creating more jobs"* for *"fighting rising prices"* changes respondents classified as materialists or post-materialists. This risk was mitigated in this thesis by removing desirable goals and specific situations of agile values and summarising underlying ideas as keywords.

5.3.4 Interviewee Background Information

Background information questions were used to help in analysing results. Questions related to the background, were asked in beginning of interview in order to open and warm up the interview situation.

Nationality was the most important of background questions since the main objective of this thesis was to study if there is relationship between agile and national values. In addition to nationality, short survey [ITIM, 2011] about respondent's cultural dimension was sent for interviewees after actual interview. Template used in this survey can be found from the Appendix 3. Purpose of this was to see how close or far respondent's personal values were with average values from the respondent's country. Imitating Hofstede's original survey, formula for calculating personal values in this shortened survey was based on summing points from five responses within cultural dimensions, multiplying that sum by five and then reducing twenty five points. For example in the Power Distance dimension if the answer for a single question was close to low power distance, that received one point and if it was close to high power distance, it received five points.

Considering *age,* Schwartz [2012, p. 278] writes that age correlates most positively with conservation values (tradition, conformity and security) and most negatively openness to change values (self-direction, stimulation). Similarly Hofstede and others [2010, p. 200] describe that older employees have more rule orientation. Schwartz continues that age also correlates negatively with power and achievement, which are attributes used to describe high masculinity. If we assume that agile advocates low uncertainty avoidance and high masculinity, we can conclude that younger people would be more willing to adopt agile. Based on these facts, age of respondent was asked in the survey.

Education according to Schwartz [2012, p. 278] affects positively to openness, non-routine ideas and activity. Agile favours empirical approach and embrace changes so based on this, agile could be adopted more easily by people with higher education. When selecting interviewees, people with roughly same educational level were favoured in order to minimize effect of this variable. In the case organization respondents were software professionals with typically higher educational level. In addition to formal education, respondents' experience of software and especially agile development was asked. It was interesting to see learned agile values prevail over national values.

Hofstede and others [2010, pp. 148 - 149] write that also *gender* affects to masculinity - dimension. In the countries with higher masculinity value, gap in masculinity dimension between male and female is bigger than in low masculinity countries converging almost to non-existing in feminine countries. In other words, countries where the masculinity dimension is higher, men are tougher and more competitive than women in the same country. Both sexes in high masculinity countries are still in general more competitive than male and female in lower masculinity countries. Hofstede and others continue that also age has effect in masculinity values. People tend to get less masculine as they get older closing the masculinity gap between sexes at the age of 45. How all this relate to agile values and this research? As it was assumed, agile values favour high masculinity. Consequently, we can think that agile could be more easily adopted by younger people and males especially in the countries with high masculinity.

Interviewee *role* in the project team was the last of the background questions. In this research only roles working directly in projects were focused in order to respondents to have real life, not theoretical, understanding of software development and agile. On the other hand,

Hofstede and others [2010, p. 150] write that engineering and technical roles (like architects, developers and test engineers) hold more masculine values in general than managerial roles represented by project managers and team leads. This is due to fact that first mentioned focus mostly on technical problems, while managerial roles deal also with human problems. Therefore managers have also assertive and nurturing elements in their work.

5.3.5 Interview Questions

Interviews were started with word associations, which purpose was to get meaning of keywords relating to agile values. If agile values and principles would have been used directly in these interviews, the risk of respondent answering what he or she thinks to be "right" answer would have been higher. All keywords used had also some relationship with agile and Hofstede's cultural dimensions. After all we did not want to repeat work done by Hofstede and other cross-cultural researchers. An example of question used was "*What management in projects means for you?"* The reason for asking questions in this way was that values can be only examined if there are no prevailing conditions in questions that might affect to answers.

Respondent were also encouraged to answer as spontaneously as possible by saying that there were no right or wrong answers. Again purpose of this is to avoid respondent to give pre-thought answers that were learned. For the convenience of readers, the summary of keywords and assumed relationships with cultural dimensions can be found from the Appendix 2.

Respondent's understanding on certain keyword was explored further from the respondent nationality point of view. As an example of this kind of question was *"How Chinese software developer would like project work to be managed?"* The reason why respondents were asked to describe from other persons point of view, was that according to Scwhartz [2012, p. 274] comparing self would focus on self-characteristics instead of overall value-relevant aspects.

5.3.6 Keywords and Themes Used in Interviews

The purpose of using keywords, not agile values and principles was to provoke spontaneous reaction from respondents. The initial keywords and rationale behind using certain keyword is explained in this section.

First keywords in the interviews were related to power distance. *Self-organization* is a concept that can be seen in many agile values and principles and it is related to low power distance. Related to self-organization, also *management* was used as a keyword. As an assumption employees in countries with low power distance, expect to be at least consulted on work and decisions related to them, while in high power distance countries manager tells employees what to do. It was interesting to see if this same relationship could be seen in respondent's answers. Word *management* can also bring other relationships to surface. For example in masculine cultures, management means more often initiating structure, whereas in feminine cultures it is about concern for people. Also in highly individual cultures, freedom to adopt own way of working is appreciated, which is possible only if manager is delegating this power to team members.

Similarly *job improvement*, which is related to the agile principle describing reflection, was expected to have a relationship with power distance. When looking from the perspective of hierarchy, letting team to decide how to do things indicates low power distance. Job improvement can have also relationship with other dimensions as it means adding more content to job in masculine countries and more opportunities for cooperation in feminine countries. Another possible relationship is with low uncertainty avoidance as this keyword and related principle admits that the first process to be used in project might not be perfect. On the other hand, high uncertainty avoidance cultures would likely improve job by adding more rules and regulations.

Trust is a powerful word containing many aspects and relationships in agile. For example trusting people getting work done is an indication of low power distance, whereas in high power distance cultures manager would pay more effort on inspecting on reviewing team's work results. As an example of this is an anonymous Chinese proverb: *"What you don't inspect, you do not respect"*. Trust has also link with individualism especially if we talk the way of working. People from individual cultures expect to be able to define their own way of

working. It is no surprise that word micro-management is mostly brought up by members of low power distance cultures. On the other hand, trust and lack of micro-management can be seen as an indication of low uncertainty avoidance, in which trust replaces written procedures.

Work is another word containing multiple aspects combined into four characters. Firstly it can relate to masculinity, where people live in order to work. Approach to work is opposite for the members of feminine cultures who work in order to live. In agile this is related to sustainable pace and how people are working. The beauty of this word from the viewpoint of this thesis was that it could evoke many surprising aspects not previously thought by the author.

Word *collaboration*, is related to interactions, collaboration and working together in agile. It is a feminine value in that sense that in masculine cultures are geared more *competition.* Since there was no word known for author that would combine both aspects of collaboration and competition in a single, neutral keyword, both words were asked separately. Also *decision* is related to masculinity. In masculine cultures decisions are made quickly by fewer people when compared to more feminine cultures. Additionally answers for this word can contain hints related to low or high power distance (who makes the decision) as well to uncertainty avoidance (how much data is needed for decisions).

Linked with interactions and relationships are *conflicts*. In masculine cultures conflicts are resolved by letting strongest win but also individualistic values promote healthy conflicts and freedom of opinions. In contrast, direct conflicts are assumed to be avoided in collective cultures. For the similar reason, word *communication* was used in interviews. Face-to-face communication preferred in collectivistic culture and is needed for building relationships that is important for feminine cultures.

Words *goal* and *result* are linked to early deliveries and working software -agile principles and masculinity. Masculine cultures aim for concrete results and achievement, while feminine cultures look after relationships and security. On the other hand, this word can also reflect on uncertainty avoidance as people from low uncertainty can accept better that final result can be different than initially thought.

Also *motivation* is linked with agile and masculinity. Masculine cultures are more motivated with achievement than feminine cultures, which look for relationships over esteem. Also uncertainty avoidance dimension is linked with motivation. Cultures with high uncertainty avoidance look for safety as motivational factor. Continuing with uncertainty avoidance *innovation* and *implementation* were asked in interviews. Cultures with low uncertainty are in general better at innovating new ideas due to out-of-box thinking but worse at implementing innovations detail orientation. Cultures with high uncertainty avoidance are naturally on the opposite side of these characteristics. Regarding uncertainty avoidance and agile, keywords *documentation, planning, process, design* and *change* were used. It was assumed that respondents from low uncertainty avoidance cultures would stress on less definitions, lighter processes and possibility of change when compared with members from high uncertainty avoidance.

Keywords related to long-term orientation, were not asked in team member interviews due to fact that cross-cultural expert could not identify relationship between this dimension and agile. However, this dimension was kept in mind when analysing interview results.

5.4 Analysis

Tuomi and Sarajärvi [2002, pp. 110 - 111] write that analysis can be divided roughly to three phases, those being reducing and simplifying collected data, clustering data and creating theories based on clustered data. More specifically sequential steps in data analysis are

- Listening interviews and documenting those word by word.
- Reading written interviews.
- Finding essential information from written interviews and writing those as simplified expressions.
- Listing simplified expressions.
- Identifying similarities and differences from listed analysis units.
- Grouping similar analysis units and naming groups.
- Combining similar sub-groups into bigger categories and naming categories.
- Grouping bigger categories as a single group that is answering research questions.

Regarding categorization Tuomi and Sarajärvi [2002, p. 112] write that before starting actual analysis on data analysis unit must be decided. Analysis unit can be an expression, part of the sentence or overall thought related to the topic studied. In this thesis, overall thought related to asked keyword was used as an analysis unit lowering the risk of oversimplifying data and losing some valuable information.

Grouping is also the most critical part in the analysis, because based on this research defines which expressions belong to certain group affecting also to results. Synthesis of agile values and principles was used in grouping when analysing interviews and presenting results. Tuomi and Sarajärvi [2002, p. 115] summarise analysis process by saying that in the abstraction, empirical data is connected with theoretical concepts resulting model, terminology and themes describing collected data.

6 CROSS-CULTURAL EXPERT INTERVIEW

The purpose of this interview was to identify and understand relationship between agile and Hofstede's cultural framework with the help of cross-cultural expert (introduced in the Section 6.1) Role of the author in this interview, was in addition to facilitate the interview situation, also explain background and idea of agile values and principles for the cross-cultural expert who was not familiar with these. Key points from this discussion are described in the Section (6.2). In that section, also author's previous assumptions based on the literature is compared to the results of this interview.

6.1 Introduction of Cross-Cultural Expert

Role of the cross-cultural expert was to provide deeper understanding on Hofstede's cultural dimensions when comparing those with agile values and principles. She is currently working as a consultant with individuals and teams in increasing their intercultural sensitivity and enhancing cross-cultural communication. She is originally Finnish but has also lived in 6 other countries (Brazil, US, Belgium, Denmark, Colombia and the UK), worked in 35 countries across six continents and travelled in almost 70 countries. From the viewpoint of this study, her working experience and global mind-set increased objectivity and validity of conclusions made for the relationship of agile and national cultures.

6.2 Agile Values and Principles Analysed From the Cross-Cultural Perspective

According to cross-cultural expert, *Individuals and interactions over processes and tools* had signs of low power distance because in this kind of cultures individuals and their relationship have importance regardless of individual's status. Higher power distance cultures would not have this kind of equal approach. Word individuals also referred to individuality although interactions referred to groups, which can be seen as a sign of collectivism. However, this agile value was still slightly more individual according to her. Also relationship with low uncertainty avoidance was evident as high uncertainty avoidance cultures would prefer detailed processes. It is also worth to mention that already in this point of the interview (first value to be analysed) she said: *"These values sound very Anglo-Saxon"*. This was an interesting result itself because the basic idea of Hofstede's cultural framework is that

society, it rules and norms represent underlying beliefs. In other words, values in agile manifesto represent underlying values of those authors, who are from Anglo-Saxon culture.

In the *Working software over comprehensive documentation* cross-cultural expert could very easily identify the same low uncertainty avoidance that was also identified based on literature review. But relationship with low power distance was something that we could not have recognized earlier. The rationale with this relationship was that in countries with high power distance, employees should cover their back in case something unfortunate happens and for that documentation provides a convenient way. *Customer collaboration over contract negotiation* was the first value that she identified relationship with masculinity dimension or to be more specific, the feminine side of that dimension. Collaboration is an activity that is highlighted in feminine countries such as Nordic countries. Also favouring relationship over written contracts points to low uncertainty avoidance. This value had also slight indication of long-term orientation because collaboration is usually a longer process compared to negotiating single contract.

Responding to change over following a plan expressed possibility of uncertainty and change, which again points towards low uncertainty avoidance as cross-cultural expert explained. High uncertainty avoidance cultures try lower this uncertainty by detailed planning but this value was proposing exactly opposite. Moving goals and targets refers also to femininity as masculine cultures would prefer clearer goals. Continuing with agile principles behind agile manifesto, she could identify masculinity in the first principle stating: *Our highest priority is to satisfy the customer through early and continuous delivery of valuable software* because of the principle focusing on concrete results. Early delivery refers also to short-term orientation.

The relationship between low uncertainty avoidance and *Welcome changing requirements* -principle was evident for cross-cultural expert and author because of expecting and accepting the change as in similar agile value. In addition, cross-cultural expert identified masculinity related to *competitive advantage* -phrase in the sentence. She continued that *Deliver working software frequently...* -principle refers to low uncertainty avoidance mostly because of *with a preference to the shorter timescale* -phrase. According to cross-cultural expert high uncertainty avoidance cultures would plan more in the beginning, which was in conflict with preference of quick deliveries. Also shorter timescale has clear indication of short-term orientation.

"This is exciting" was the multi-cultural expert first reaction when she looked at *Business people and developers must work together...* -principle. The reason for her spontaneous reaction was word *must* in this principle. As she explained: *"Working together is something that does not happen naturally for masculine and individual cultures, in which people have individual goals and their priority is to achieve those even if team goals would be risked."* When we remember that these principles come from USA, which is a masculine and individual culture, this could be taken as another example of underlying national values presented indirectly in agile manifesto. Business people and developers are typically in different level in organizational hierarchy and therefore working together hints also about low power distance. *Build projects around motivated individuals...* -principle was also *"sooo low power distance"* according to cross-cultural expert. Role of the manager in this principle is reversed to supporting role, not managing team, and therefore this kind of statement could not be presented by people from high power distance culture. Phrase *motivated individuals* has also little bit of masculinity in it.

Comparing to earlier assumptions with *The most efficient and effective method of conveying information...*-principle, it was surprising to hear that cross-cultural expert could find collectivism in this principle. Her rationale was that relationships are important in collective cultures and best way to have a relationship is to have face-to-face conversation. In addition to this dimension, she could identify low uncertainty avoidance as author but also additionally low power distance. In high power distance countries also source of information is important, which is completely ignored in this principle.

Working software... -principle expresses masculinity according to cross-cultural expert because of very concrete goals. This principle has also some low uncertainty avoidance if we take into account written formal status and measurement reports traditionally done in the software industry. *Agile processes promote sustainable development* -principle was again interesting for cross-cultural expert. She was able to identify higher uncertainty avoidance in this principle because it needs some systematic approach and planning in order to get into *constant page indefinitely*. Sustainability itself is also a feminine, tender value.

Cross-cultural expert explained *Continuous attention...*-principle to be close medium-high uncertainty avoidance, detail-oriented culture such as Germany. But she was also able to identify masculinity in the *technical excellence* -part of this principle. Feminine cultures tend

to be more modest in their goals. *Simplicity* principle referred to optimizing, which again is result-oriented thus masculine principle. On the other hand, *maximizing work not done* can refer to lack of over engineering, which is a typical pitfall for high uncertainty avoidance cultures.

The best architectures...-principle was very low power distance and high individualism according to multi-cultural expert. She continued that *"High power distance cultures can't understand what a self-organizing team is."* Being able to define own way of working corresponds also with individualism. Similarly also principle about reflection (*At regular intervals...)* was closely related with low power distance and individualism since decision power about working methods has been given for the team

6.3 Conclusions from the Cross-Cultural Expert Interview

Based on the literature, author assumed relationship between agile and low power distance. This assumption was reinforced in the interview with cross-cultural expert, although she could also increase understanding of this relationship. For example, self-organized teams and managers supporting those is something that does not come naturally in high power distance cultures. Additionally she could identify low power distance in values related to relationships and communication on the basis that in high power distance countries interactions and communication depends also of the status of people involved with those activities.

Another relationship that was seen by both author and cross-cultural expert was agile favouring low uncertainty avoidance because of positive attitude in agile towards change and lower formalization. This relationship could be seen in numerous values and principles. There were few exceptions like *Agile values promote sustainable development* and *Continuous attention to technical excellence and good design* having signs of higher uncertainty avoidance.

Cross-cultural expert could not verify assumed relationship between *agile and short-term orientation*, although she could see few obvious signs of that in principles favouring *early deliveries* and *shorter timescale.* On the other hand, agile values and principles stress on

interactions and relationships that are typically long-term oriented values. In general, her opinion was that the relationship between agile and long-term orientation seems to be neutral.

Related to *individualism* -dimension, author could see both individualistic and collectivist values in agile. Cross-cultural expert was able to clarify these views stating that agile values seem to be more *individualistic* because of agile values and principles promote individuals and interactions, people must work together, motivated individuals, self-organization and reflection. She could also see collectivistic parts especially in principles referring to team and relationships but in general individualistic approach was stronger in agile according to her.

Similarly to individualism, author could not decide based on literature if agile is more about masculinity or femininity. Cross-cultural expert also saw both side of this dimension, but her judgement was that agile is more about masculinity. She explained that although collaboration and unclear changing goals and sustainable pace are more feminine values, these are overruled by principles defining concrete results, competitive advantage, must work together, motivated individuals and technical excellence.

Strength and direction of the relationship between agile and Hofstede's cultural dimensions based from the interview with the cross-cultural expert is summarised in the Figure 3.

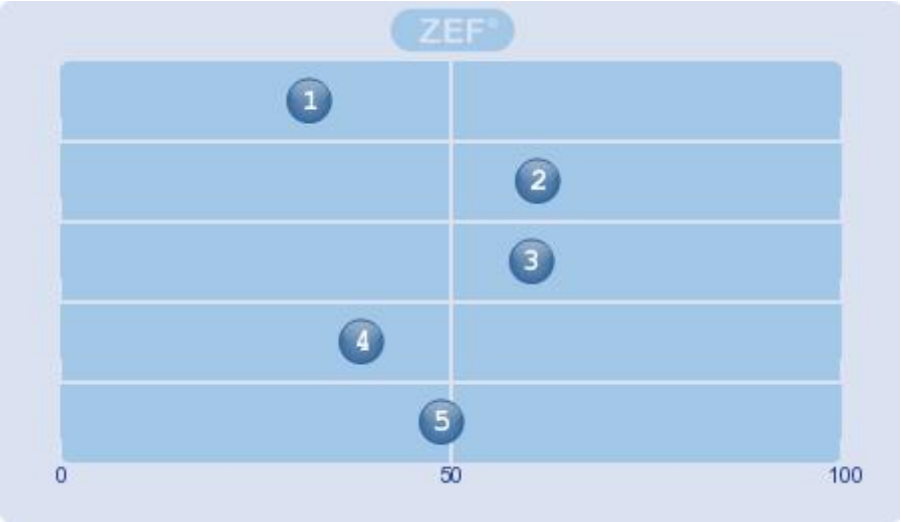

Figure 3. Cross-cultural expert's opinion on relationship strength and direction between cultural dimensions and agile. 1: PDI, 2: IDV, 3: MAS, 4: UAI, 5: LTO

When using clustering of countries, low power distance, high individualism and low uncertainty fit perfectly into *Contest* cluster represented by USA and other Anglo-Saxon countries. This result is not surprising given the fact that agile values originate from USA. When asking cross-cultural expert's opinion on which country clusters agile would be adopted most easily, her answer was that *"In the addition to Anglo-Saxon cultures, there are no reasons why these values would not work also in Nordic countries, although the definition of goals and results might differ. Rest of the world is more about high power distance and collective cultures making adoption of these values harder for them."* Interestingly this almost identical to conclusions done by Siakas and Siakas [2007] who write that agile works best in democratic type of organizations represented by Nordic and Anglo-Saxon countries and Jamaica.

As written earlier, the goal of this interview was to create better understanding on assumed relationship between agile and cultural dimensions, which was reached. Cross-cultural expert could identify the same relationships than author (low power distance and uncertainty avoidance) but additionally also high individualism and masculinity. More importantly she was able to enrich understanding on these relationships by providing concrete examples of underlying national values.

7 PROJECT MEMBER INTERVIEWS

The purpose of this chapter is to show how the assumed relationship between agile and national cultures can be seen in global software development projects. Section 7.1 introduces case organisation and Section 7.2 case projects where interviews were made. Section 7.3 describes interviewees including their personal values and Section 7.4 shows how interviews were conducted. Section 7.5 reveals signs of national cultures seen in interviews and Section 7.6 ends this chapter by giving ideas how agile could be adapted for different cultural dimensions.

7.1 Case Organization Introduction

Case organization is the largest Nordic IT services company providing full lifecycle services for both private and public sectors. The company has global presence through its product development business and the delivery centres. The company is headquartered in Helsinki, Finland and has approximately 17 000 experts operating in over 20 countries. Based on this, case company provided good opportunity for researching globally distributed agile projects.

7.2 Case Projects

All case projects were from the same case organization presented above, were organized as global software development teams and used agile methodologies. Therefore, the variability in interview results caused by differences in organizational cultures and methodologies could be minimized in the analysis phase. In general, the research setup was designed so, that differences in agile interpretation caused by personal values or national cultures, was surfaced in interviews.

Project 1 was a mobile application development project with the purpose of increasing office productivity by simplifying administrative tasks. Product owner and usability expert in this project were co-located in Finland, while six developers and their team lead were from China. Also project 2 was a mobile application development project, with the purpose of creating application for consumer markets. In addition to the application development, scope of this

project included backend development. This project had project manager and usability expert located at Finland and development teams at Finland and India.

Purpose of the project 3 was to provide mobile launch pad to intranet services. Idea is that this launch pad provides common functionalities needed by all mobile applications, which are developed by other teams independently. Project manager and developers were from Finland, one developer from China and usability expert from Latvia. Project 4 was a web development project, where backend system was migrated to new system and user interface was renewed. Project team consisted of project lead, usability and graphics designer at Finland and developers at India.

In the Table 1 below, key characteristics of case projects are presented. Outcome gives broad understanding of project type and team size about how big and complex project was. Nationalities involved was the most important project characteristic regarding this thesis.

Characteristic	**Project 1**	**Project 2**	**Project 3**	**Project 4**
Outcome	Office productivity mobile applications	Consumer mobile application	Mobile launch pad	Migration project with UI renewal
Team size	9	Several teams, total number of people involved around 50	4	Several teams, total number of people involved around 35
Nationalities involved	Finnish and Chinese	Finnish and Indian	Finnish, Chinese and Latvian	Finnish and Indian

Table 1. Case project characteristics.

7.3 Project Team Members

National cultural dimensions [Hofstede et al., 2010] and country clusters [Banks et al., 2005] from respondents are presented in the Table 2. Values above 50 were considered high on a specific dimension.

Nationality	Cluster	PDI	IDV	MAS	UAI
Finland	Network	33	63	26	59
China	Family	80	20	66	30
India	Family	77	48	56	40

Table 2. Cultural dimensions from respondents' countries.

To summarize Table 2 above, in theory Finland is a low power distance, individual and feminine culture with high uncertainty avoidance. China, as an opposite of Finland, has high power distance with collective and masculine values and low uncertainty avoidance. India, as China, is a culture with high power distance. However, India is clearly more individual culture than China. India is also more masculine compared to Finland but closer to China in this dimension as well in uncertainty avoidance. In general, Finland and India are culturally bit closer with each other compared to Finland and China.

Key characteristics from people participated in interviews are presented in the Table 3 below. In average (Tables 3 and 4), interviewees from China and India had lower power distance than assumed (Table 2), although Finns still had lower power distance compared to these two nations. Same relative difference in answers could be also seen in individualism dimension, where Chinese were less collective than expected. Regarding masculinity Chinese and Indian had lower values compared to country average but Finns were still less masculine. The only dimension where the relative order in values did not hold the assumptions was uncertainty avoidance. In that dimension, Finns were clearly less while Chinese and especially Indian interviewees higher uncertainty avoiding than expected.

ID	Nationality	Role	Age	Gender	Education	Agile and SW exp. in years	Personal Values
1	Chinese	Developer	30	Male	Masters	2 / 7	PDI: 35, IDV: 50, MAS: 45, UAI: 50
2	Finnish	UX designer	29	Female	Masters	3 / 3	PDI: 20, IDV: 70, MAS: 35, UAI: 35
3	Chinese	Developer	30	Female	Bachelor	3 / 7	PDI: 50, IDV: 65, MAS: 25, UAI: 70
4	Finnish	Developer	33	Male	Masters	6 / 10	PDI: 20, IDV: 75, MAS: 20, UAI: 45
5	Indian	Analyst	27	Female	Masters	2 / 4	PDI: 40, IDV: 65, MAS: 55, UAI: 80
6	Finnish	Developer	38	Male	Masters	2 / 14	PDI: 35, IDV: 70, MAS: 25, UAI: 45
7	Chinese	Team lead	31	Female	Bachelor	3 / 6	PDI: 50, IDV: 60, MAS: 55, UAI: 40
8	Finnish	UX designer	44	Female	Bachelor	3 / 10	PDI: 40, IDV: 60, MAS: 25, UAI: 30
9	Indian	Developer	27	Female	Masters	0 / 4	PDI: 45, IDV: 45, MAS: 30, UAI: 60
10	Indian	Developer	25	Female	Bachelor	0 / 3	PDI: 55, IDV: 70, MAS: 75, UAI: 50
11	Finnish	Project lead	62	Female	Masters	1 / 35	PDI: 25, IDV: 75, MAS: 35, UAI: 35

Table 3. Respondents key characteristics.

These results show that in the individual level there can be lot of variation with values, although differences between nations could be seen as assumed with the exception of uncertainty avoidance. However, it is important to remember that sample size (from 2 to 5) was too small to make any statistically valid conclusions. Another factor explaining this result was that limited question set (Appendix 3) compared to Hofstede's initial survey was used to measure personal values. This meant that one question had more weight and therefore could impact more on the results.

Nationality	Sample size	PDI	IDV	MAS	UAI	Agile experience in years	SW experience in years
Finnish	5	28	70	28	38	3	14
Chinese	3	45	58	42	53	3	7
Indian	3	47	60	53	63	1	4

Table 4. Interviewees average values by dimension.

Regarding other key characteristics, age, gender and education did not seem to have any effect on personal values. For example Finnish UX designer (2) and project lead (11) had almost identical values regardless their 33 years difference in age. What it came to agile experience, Finns had slightly more of it compared to Chinese (decimals are not shown in Table 4) although relative agile experience compared with the total software development experience was highest in China. In other words, we could assume that the impact of agile could be seen most in answers by Chinese interviewees.

7.4 Conducting Interviews

Most of the interviews were done face to face as in this way it was easier to create trust needed for open communication. Priority for face to face interviews also affected on respondent selection. For example, Indian business analyst and developers were selected on the basis them visiting at Finland. For practical reasons, Chinese were interviewed via online collaboration tool. In their case, building open atmosphere in interview without possibility to see face to face was not an issue since researcher had worked with them earlier. Interviews in general were roughly one hour long although there were some exceptions such as with Chinese team lead (7) which took two hours. After interviews a short survey about personal cultural values (Appendix 3) was sent for interviewees via Google Drive.

After the first four interviews, invitation and instructions given for interviewees were modified so that use of word agile was avoided. This was due to fact that setting stage for agile might have affected on people's answers. In other words, people could have modified their answers consciously or unconsciously towards more agile. After omitting word agile

from interviews, direct references to agile in answers reduced although some interviewees still recognized some keywords (such as working software) referring to agile. In addition to omitting word agile, order of keywords asked was changed as interviews progressed. This was done as researcher's insight and understanding of keywords increased and those could be asked in a more fluent and natural order. In the first seven interviews, keywords were asked as pairs but the keyword pairs did not necessarily have any logical connection. For example word management started interviews and was followed by self-organization but then the next word was job improvement, which was very loosely connected with the previous keywords. In the four last interviews, keywords were combined into more logical groupings which were also used when analysing and representing interview results shown below.

All interviews were written down and recorded in order to ensure that no data was missed in case interviewer could not write down all details. After interviews, respondents were asked to fill personal values survey. Having personal values available during the transcribing and analysis phases, was very valuable as some of respondent's values differed greatly from country averages, which could be seen also in their answers. Long term orientation was asked in interviews, but it was omitted from results during the analysis phase as it was assumed that there was no clear relationship between this dimension and agile.

In the transcribing phase, keywords were first grouped based on themes described in agile synthesis section. Interviews were then analysed one by one. In the transcribing process itself, written notes were first analysed in order to spot phrases that might have relationship with agile and national cultures. After notes were analysed and thoughts structured to this thesis, recording was listened in case something was missing from notes. Although, it was a time consuming process this ensured that data was not lost during the transcribing. As some themes like self-organization grew too big, those were then divided to smaller sub-groups.

7.5 Signs of National Cultures in Agile Projects

Following sections present interview results grouped by key characteristics in agile. These agile key characteristics are concrete and early results, flexibility, empiricism, simplicity, self-organization, informal communication and collaboration, continuous learning and sustainability in work.

7.5.1 Self-Organizing Teams

Keywords: management, self-organization, responsibility

Self-organization is often heard term in agile and therefore it was analysed first. As assumed earlier, self-organization should happen most easily in low power distance and individual cultures, where initiative and individual opinions are expected and appreciated.

Interviews were always started with keyword *management*, which was assumed to be an opposite for self-organization. For Finnish UX designer (2) management was *"empowering team and lack of micromanagement"*. Her wish for this kind of management style was backed up by Finnish developer (4) who defined that *"management should give direction and boundaries but not details"*. Finnish developer (6) thought management to be necessary and challenging area, although previously he had thought it to be something for people who cannot do other things. His personal preference was on managing technical issues rather than people. Also Finnish project lead (11) and UX designer (8) defined this keyword as management of issues. She (11) continued that Finns did not like if are watched over shoulder referring to too much of control. Instead, for her (11) manager's role was to support others' work. All of the definitions above highlighted aspects that are typical for low power distance cultures. Additionally focusing on tasks in management and the preference of working alone indicated individualism.

For Chinese developer (3) management meant *"project manager making sure that requirements and resources align and goals are clear for every team member"*. Indian business analyst (5) said that *"Hierarchy is expected in management and Indian team would want to have defined set of rules and responsibilities"*. Also interview with Indian developer

(10) reinforced previous views regarding hierarchy. Her expectation for the management was team lead dividing work for team members and people working according their own responsibilities. All these answers above indicated high power distance. She (10) also emphasized importance of having good relationship between team lead and team members, which could be result of collective or feminine values, although her personal values did not explain this.

For Indian developer (9), management was more about how efficiently things were done within schedule and with limited resources using documentation as guidance. Her answer lacked signs of high power distance but had masculinity and uncertainty avoidance in it due to the emphasis on efficiency and documentation. As opposite to the previous answers, Chinese team lead (7) felt that management should mainly support team and intervene only if needed. This kind of statement implied lower power distance. Her personal value in this dimension was 50, which was exactly in middle of the dimension meaning that both sides of power distance could be expected to be seen in her answers.

Self-organization meant for Chinese developer (1) *"working according to plans and waiting for customer to provide details"* and for Chinese developer (3) *"results for self-organization should be defined"*. Chinese team lead (7) said regarding self-organization *"it depends of people or team maturity but it is not so easy because information is not shared"*. She (7) continued her analysis by saying that *"in China students are aiming for getting high scores on exams and expect to have clear orders and instructions*. This kind of selective information sharing and expecting clear orders is typical in high power distance as is emphasizing good scores as learning objectives in masculine cultures.

For Finnish UX designer (2) and developer (4) self-organization was more about team taking responsibility of own actions and thinking by themselves. Finnish project lead (11) felt that her compatriots were working independently in projects and role of manager was more to give direction and support if there were problems or things needed to be clarified. She (11) also emphasised that manager should know about daily operations indicating high uncertainty avoidance. Finnish UX designer (8) added lack of supervision for attributes of a self-organizing team. Regarding initiative, she thought that Finns were willing to take that. Finnish developer (6) shared previous views by defining self-organization as lack of micromanagement and team capable of deciding how things should be done. In all of the

answers above we could see the same indications of low power distance (team taking responsibility, thinking themselves, working independently) than in the case of management keyword. He (6) had also noted that in India things went smoother if there was someone who was leading, which indicated relatively higher power distance in India.

Indian analyst (5) defined self-organization to be taking individual responsibility and team initiative, which didn't have any signs of high power distance as assumed. This could be also explained by her personal values that were lower in power distance and higher in individualism compared to her compatriots. Indian developer (10), explained self-organization through detailed description of software development process reducing need of rework, preventing errors (*"if you follow this protocol it automatically prevents you of making errors")* and producing needed documentation in case something went wrong. This was an interesting answer because it revealed not only high power distance with cover your back mentality as expected but surprisingly high uncertainty avoidance in the form of avoiding mistakes. For Indian developer (9) self-organization was how effectively she could manage her own work and learn new things. She (9) continued that Indian developer typically liked to have self-organization done through routines and documentation. Her answer again lacked signs of power distance but had masculine and uncertainty avoidance flavours with words effectiveness, routine and documentation.

With the purpose of complementing keywords above, *responsibility* was also asked in the interviews. Chinese developers (1 and 3) and Indian developer (9) approached it by saying that *"responsibility should be made clear for each developer"*. Indian developer (10) added that for her responsibility meant *"what to do in which time by project manager"* and when receiving those orders then *"work cautiously and in a right way"*. Chinese team lead (7) answered this keyword with a story of a local developer who had lot of ideas about the project but didn't express those since it wasn't on his responsibility. She (7) continued that responsibility taking was linked for her how you treated people. If people were told only to do coding, behaviour described in her story was natural. In addition, she (7) told that people sometimes did not want to take more responsibility because they feared that by doing it they would have shown disrespect for their managers. These answers implied high power distance and additionally high uncertainty avoidance (work cautiously) in case of Indian developer (10). Indian analyst (5) approached responsibility through expectations from others, which

could mean either masculinity (clearer goals) or high uncertainty avoidance (removing ambiguity).

Finns (2, 4 and 11) said that ideally for them responsibility was delegated to team members. Team members should do their job according to what were agreed but they also added that enough space should be given and work should not be too closely monitored. Finnish UX designer (2) summarized above by saying "*giving responsibility feels that you are appreciated, which motivates. And then enough space should be given to get the job done*". This is again a classical example of low power distance that we have seen with earlier keywords. For Finnish UX designer (8) responsibility was developers wanting to have individual goals. Likewise, Finnish developer (6) saw that responsibility came from motivated individuals. For him (6) it was keeping committed goals and promises. He (6) continued that especially errors were good test for responsibility taking. According to him (6), person who made the mistake should take responsibility of admitting and fixing it.

To summarize, this section focused on how national cultures affected on building and managing (if you can use such word in this context) of a self-organizing team. In most the answers, impact of power distance could be seen. People from high power distance cultures expected hierarchy and managers to give clear instructions. For example, they expressed and described need for hierarchy even when talking about self-organizing teams. On the contrary, members from low power distance cultures shared dislike of managers giving too many instructions and were more willing to show self-initiative. In general, answers from interviewees with low power distance values were closer to agile principles than their colleagues from high power distance cultures. This confirmed our earlier assumption that self-organized teams take place more naturally in cultures with low power distance and also strengthened our thoughts that agile must be adapted for global software teams.

7.5.2 Trust Motivated Individuals

Keywords: motivation, trust

This section focuses on motivation and trust. It was interesting to see what motivates different cultures as agile lefts that part open. One factor could be trust, which has been rated

the most important factor for high performing knowledge teams. On the other hand, agile principles state that team should be trusted indicating again connection with low power distance.

Trust was seen as keeping promises by Finnish developers (4 and 6) and Finnish UX designers (2 and 8). Finnish UX designer (2) also added that people expected to be trusted with no control from management and trust is built by continuous communication and collaboration. Finnish UX developer (8) amended this by saying that trust is built by giving responsibility to team. Finnish developer (6) had different mechanisms for building trust. He emphasised accurate specifications and review mechanisms as ways to build trust and avoiding errors. Finnish responses in general indicated again low power distance (no control). In UX designer (2) answer we could see also feminine values (continuous communication and collaboration) and for developer (6) high uncertainty avoidance (detailed specifications and reviews in order to reduce ambiguity). Finnish project lead (11) added that direct and open communication without hiding things increased trust for her.

For Chinese developer (1) trust was coming from the family. According to him (1), trust was built by supervisor asking details and people caring for each other. He (1) also added that if individual's technique was strong then other people trusted on that person. In his answer we could see collective (trust coming from family and people caring each other), high power distance (supervisor asking details) and masculine values (technical excellence emphasized). Chinese developer (3) highlighted people working according to their roles and project manager controlling the whole project (high power distance) when discussing about trust with her.

Chinese team lead (7) defined trust by relying on other opinions and no micromanaging, which indicated low uncertainty avoidance and power distance. She had experienced that sometimes there could be issues regarding trust when Chinese tried to meet requirements without having enough details or possibly having different understanding what should be done. This kind of motivation to meet requirements even when lacking some crucial information indicated not only masculinity but also low uncertainty avoidance. She also recognized face to face meetings important for building trust. This could indicate collectivism but also common sense since face to face meetings have been mentioned by Paasivaara and others [2010, p. 21] as an important mechanism for building trust.

For Indian analyst (5) trust could be built, when team members were heard and acted based on their suggestions. Indian developer (10) defined trust to be doing work given as perfectly as possible. This kind of aim for perfection demonstrated high uncertainty avoidance. Indian developer (9) judged if someone is trustworthy by comparing what that person had said and how things really were. If those differed, she lost trust on that person. She (9) used documentation as evidence in this evaluation process again indicating high uncertainty avoidance.

Some answers from people with low power distance values were close to agile principle of trust them to get the job done supporting assumption on the positive relationship between this dimension and agile. In cultures with high power distance, trust them in agile principle meant different. People from these countries expected managers to pay attention to the details in order to build trust upon him or her.

Related to individuals, *motivation* was also discussed. For Finns (2, 4 and 6), motivation came from understanding how others benefit from your work and doing things together. This kind of humanization of work by contact and cooperation indicated feminine culture although Finnish developer (4) mentioned also project reward (a masculine goal) and Finnish developer (6) continuous learning (high uncertainty avoidance) as sources of motivation. Finnish project lead (11) approached this keyword from intrinsic perspective saying that motivation came for her from having responsibility and controlling own work but also social relationships in work place. From this answer we could recognize individualistic (controlling own work) and feminine (social relationships) values. From things that reduced motivation, she mentioned layoffs in the organization. This gave a hint of high uncertainty avoidance where security is an important motivator. Also Finnish UX designer (8) felt that getting responsibility increased motivation but additionally also possibility of doing new and important things.

For Chinese developers (1 and 3), motivation was gained from exciting and challenging assignments. Indian business analyst (5) said that good motivation in her culture was achieved by giving feedback and understanding what team wanted. This kind of need for direct communication was a sign of low power distance that could be explained by her (5) personal low power distance (Table 3) compared to the average in India. Chinese team lead (7) got motivation from little things like positive feedback and feeling that others cared about

you. This seemed more feminine value than expected from her culture (Table 2). Motivation for Indian developers (9 and 10) came from excelling at work, example shown by more senior people and rewards. This statement had signs of high power distance and masculinity.

As a general rule, trust was seen as keeping promises for members from low power distance societies. Related to this they required less control from managers. On the contrary, giving detailed instructions built trust towards managers in high power distance countries. Regarding motivation, members from masculine countries were motivated by status and money, whereas members from feminine countries mentioned good collaboration more often.

7.5.3 How Decisions Are Made?

Keywords: decision, problem

Self-organized project teams should be capable of making decisions and solving problems by themselves. As an assumption, decision making process for feminine countries resembles spiral. On the other hand, members from high power distance and collective countries require clear decision makers but group should also have common opinion. Additionally, members from high uncertainty avoidance societies require more facts for the decision making. What it comes to problems, shame related to errors happen more often at collectivistic countries. In high uncertainty avoidance people try to avoid mistakes by putting more effort in the details before actual error occur.

Both Chinese developers (1 and 3) stressed about involving whole team to decision making but then other developer (3) continued that *"in the end team wants manager to decide"*. Chinese team lead (7) described that in China people have used to live their life so that it is decided by their parents. She (7) concluded that everybody wanted to make decisions but in reality it is hard when roles are different and people might not have enough power to make decisions. In this case, people in her (7) country usually changed their minds to follow people with more power. Similarly Indian business analyst (5) said that *"generally decisions are made by managers although input from team members is taken"*. For Indian developer (10) decision was *"taking approvals at right time"*. In all of the answers above, we could see signs of high power distance (manager and parents to decide, follow people with more

power). In addition to above, Indian developer (9) talked about evidence, careful analysis and involving people when making decisions. In her answer, need for evidence indicated high uncertainty avoidance and involving people feminine values.

Similarly, Finnish project lead (11) required facts, consulting experts and rules for making decisions, showing again signs of high uncertainty avoidance. Finnish UX designer (2) and developer (4) also emphasised involving people discussing decisions that affected to their work and stressed *"people losing motivation"* if they were not heard. Likewise, Finnish developer (6) felt that people doing the work should be listened and consulted more. In their answers, signs of low power distance and feminine values (involving people) were evident. Finnish UX designer (8) said that *"decisions must be made even sometimes it can be difficult"*. She continued, that Finns usually wanted that there is someone who can make decisions. This suggested long decision making process typical in feminine countries with the hint of high power distance.

Signs of collectivism and power distance could be seen when Chinese developer (1) described that *"Chinese developers do not want to display problems for managers but want to solve those by themselves"*. Chinese developer (3), Indian analyst (5) and Indian developer (10) were more open to discuss problems, which could be explained by the fact that their personal values were quite individualistic. For Indian developer (9) problem occurred when she knew what to do but did not know how to do it. Her mechanism for solving problems was doing first analysis by herself and if she was not able to solve problem, she contacted her colleagues. In this answer we could see traits of high uncertainty (analysis) and collectivism (trying to solve problem first alone).

For Finnish UX designer (2) problem solving was done by contacting swiftly expert, which pointed to uncertainty avoidance where expertise is appreciated. On the other hand, Finnish developer (4) was keen on having problems to solve from time to time, which could indicate feminine values in the form of accepting changing and surprising goals (problems are not planned) but also masculinity as challenging goals. Finnish developer (6) tried to prevent problems to happen in the first place with careful specification and review process, again indicating higher uncertainty avoidance. Finnish project lead (11) defined that problems were something to be solved. She had also noticed that sometimes people gave up too easily if they faced difficult problems. According to her (11), project manager was needed most in these

situations. This kind of decisiveness indicated masculinity in her case. Finnish UX designer (8) complemented previous answers by adding that Finns were used to solve problems individually and openly. When those were solved, Finns did not typically make big fuss about it. Modesty is a feminine value and solving problems individually, well points to individualism.

As a summary of this section, we could again see signs of national cultures in interviewee's answers, although those did not go always as expected. In general, decision making was more managers' responsibility in high power distance countries. However, both collective and feminine countries stressed to involve people in decision making. Related to problems, people from masculine and collectivistic countries did not want to show those openly because of shame attached to failing. Members from high uncertainty avoidance tried to prevent mistakes from happening with careful planning, specifications and reviews. Sometimes this was feasible but there was also a risk of over-processing involved in this approach.

7.5.4 Individuals and Interactions

Keywords: collaboration, competition, communication, conflict

In agile, collaboration between people is more important than processes and tools. This was examined in interviews by asking about collaboration, competition, communication and conflict. The assumption was that collective and feminine cultures would prefer collaboration, while masculine cultures would have more competitive focus. On the other hand, collective cultures tend to avoid direct conflict but in high uncertainty avoidance cultures emotions can be shown openly.

It was bit surprising to see that Chinese developer (1) from collective culture was saying that people did not *collaborate* or *communicate* if certain task was not on their common responsibility. When thinking this more thoroughly, we could recognize high power distance (hierarchy and roles) and masculinity (competition between developers) from his statement. Chinese team lead (7) felt that sometimes they were treated as people from developing country regardless the skills they had presented in projects. Needless to say, this kind of imperialistic attitude should not have happened in global delivery projects. Instead, she (7)

said that Chinese would have liked to get more involved in earlier phases and having ownership of work, not just doing tasks assigned for them. She (7) also wanted to have more equal information sharing, not just them reporting to onsite. She (7) continued that in *"in China work will be more effective if people have a good relationship"* and *"if there are problems with relationship between colleagues, people are reluctant to bring this for managers because fearing of being labelled as incompetent"*. To summarize, there were signs of collective culture (good relationship) but also will for lower power distance in her answer.

Finnish UX designer (2) recognized Finns typically being self-initiative and working alone that leans clearly towards individualism. Her opinion was backed up by Finnish project lead (11), who recognized Finns to be individualistic people preferring to work alone exactly as he or she wanted to work. For her (11) this was the main difficulty when working with collective cultures. She (11) also thought that Finns preferred to communicate via email that indicated again individualism but also high uncertainty avoidance. As on opposite to previous, Finnish developers (4 and 6) preferred seeing people face to face, which helped to build relationship with colleagues and working together in the future. For Finnish UX designer (8) collaboration was one area that was mostly affected by individual personality some being introverts and some extroverts. That may be true, but then she continued that Finns in general take longer time to know others showing signs of national culture. She (8) had also noticed that Finns wanted to have information to be served for them implying higher uncertainty avoidance. Continuing with communication, her understanding of Finns was that documentation was not enough for them but people usually wanted to discuss and go through different things together indicating feminine values.

Indian analyst (5) emphasized open and transparent flow of information when talking about communication. This was bit surprising assuming that in high power distance countries like India, knowledge is power which should be shared with caution. On the other hand, her personal power distance was below India's average value. Indian developer (10) could not give any association for collaboration since according to her, it was more management duty. When asked again, she explained it to be good relationship with customer so that company will get also next project. In her answer high power distance (management duty) could be clearly seen. When discussing about communication with her (10), she stressed on knowing person first and not showing emotions. These indicated collective values and low uncertainty avoidance. She (10) also recognized differences between national values and habits in this

keyword. Indian developer (9) felt very positively about collaboration and said that *"in India it is a common thing to help each other"* again showing traits of collective values. Regarding communication she felt that this was more personal value than any other keyword.

If we think *competition* as an opposite to collaboration and consensus, masculine cultures would prefer it and feminine avoid it. This was evident in Chinese developers (1 and 3), Chinese team lead (7), Indian business analyst (5) and developers (9 and 10) answers, when they said that for them it is not bad and it always existed. In fact, healthy competition between project team members was seen as a good thing for them as it helped on getting results and improving skills. As an opposite, Finnish UX designers (2 and 8) said that *"competition does not likely happen in projects"* and Finnish developer (4) felt negatively about competition. Finnish project lead (11) said that competition exists but not openly in Finland. Her view was shared by Finnish developer (6), who said that competition happen individually but people did not take credit if they did something very well. For him (6) it was more important that issues were solved together rather than he or somebody else could have excelled. All the answers above showed difference between masculine and feminine values.

What it came to *conflicts*, power distance could be clearly seen in Chinese developer's (1) answer: *"conflict should be solved by manager"*. Chinese developer (3) suggested that conflicts would be best handled directly by parties involved. Chinese team lead (7) liked conflicts as those surfaced different ideas leading to better solutions. When talking about solving conflicts, she (7) thought that expressing their own ideas and opinions could be difficult for Chinese. According to Finnish UX designer (2), conflicts were avoided in Finland but also taken very emotionally. Her (2) finding was reinforced in Finnish UX designer (8) answer where she said that in conflict situations *"sometimes it is better to burst and show emotions than dwell and keep those motions inside you"*. Showing emotions is typical in higher uncertainty avoidance cultures. Finnish developer (4) and project lead (11) said that conflicts should be resolved by discussion and negotiation, which was almost a definition for conflict resolution of feminine cultures by Hofstede and others [2010, p. 170].

Indian analyst (5) suggested that conflicts should be solved by teamwork and good communication. For Indian developer (10) conflicts were natural part of work when opinions differed. Therefore, conflicts should be first tried to be solved by people involved in conflict. If they could not settle argument then project manager or team lead should be consulted.

Indian developer (9) said that conflict may arise and should happen if people had different point of view of the same thing. These were solved by letting the best idea win, which points to masculine values.

To summarize, members from collective and feminine cultures thought that collaboration and face to face interactions were important to have in projects. On the other hand, conflicts were expected and accepted in masculine cultures and involved more emotions in high uncertainty avoidance cultures. When talking about solving conflicts, it required more managerial involvement in high power distance countries. Differences between national values were clearest what it came to competition. Open competition within project was avoided in feminine countries but seen as an important motivator in masculine countries.

7.5.5 Well Planned Is Half Done?

Keyword: planning, goal, change, result

Planning and especially detailed upfront planning is often downplayed by agile society. However, when looked this keyword from the viewpoint of national cultures, we could assume that detailed plans were favoured by the members from high uncertainty avoidance countries. Related to planning also goals and results were discussed. In theory, members from masculine cultures, driven by achievement, require clear goals in order to reach those. On the other hand, feminine cultures can accept changing and more subjective goals. The same thing applies with results, where masculine cultures like to see more concrete results and feminine cultures accept more modest and subjective results. What comes to changes, low uncertainty cultures are more open for it.

Chinese developer (1) liked to have lot of time for *planning* indicating high uncertainty avoidance, not typical in China. When looking on his personal values, he had scored 50 in uncertainty avoidance, which could explain his response. For Chinese developer (2) *"project manager will plan the whole project and developer need to plan how and when functionality will be finished"*. This sounded hierarchical and was a result of high power distance. Chinese team lead (7) did not have strict plans in her personal life but saw importance of having plans

at work. She (7) added that people were eager to know what happened before and after implementation the latter indicating long term thinking typical in Asian cultures

Continuing with planning Finnish UX designer (2) even quoted a Finnish proverb by saying that *"well planned is half done"*. This is typical in high uncertainty avoidance cultures, although she continued that plans were made for change as long changes were justified. Likewise, also Finnish UX designer (8) recognized that plans change often. This openness for change could be learned from agile but high uncertainty avoidance influences this change tolerance with the need of justified changes. In addition, feminine cultures accept better changing goals than masculine cultures. Finnish project lead (11) recognized importance of planning but she also admitted that there needed to be flexibility built-in those plans. Finnish developer (6) said that in the agile development, planning had become easier due to fact that everything did not need to be planned in detail in the beginning of a project.

Indian analyst (5) required also clarity by planning, although she added that *"too much of planning by too many spoils the project"*. The latter phrase could be outcome of member from a masculine culture viewing planning driven by members from feminine culture. This usually involves more people and consensus made decisions. For Indian developer (10) planning was the most important stage in the project, in which everything that might happen should be considered. Likewise, Indian developer (9) thought that planning was very important and she explained a detailed planning process in her answer. All answers by Indian respondents indicated higher uncertainty avoidance than expected.

Keywords *goal* and *result* were used in interviews in order to understand how cultural values influenced on target setting and project outcome. The assumption was that masculine cultures would prefer clearer goals than feminine cultures. This assumption did not stand for Chinese developer (1) to whom goals meant *"improving themselves and trying to find pleasure in daily life and work"*. Chinese developer (3) answer was closer to the assumption when she said that *"making a clear goal will have more controllable results"*. According to Chinese team lead (7), one should have goals in work and those should be measurable. She (7) continued that in China goals were set by managers, which implied high power distance. She (7) hoped for individual goals, competitions and rewards in projects in order to motivate people to work harder. This sounded more individualistic than assumed, although her

personal value in this dimension could explain this statement. Results for her (7) were linked with targets and she wished for more systematic analysis of deliveries regarding results.

Also Indian analyst (5) preferred of having clearly defined goals so that *"one knows exactly what is expected"*. Indian developers (9 and 10) amended this by saying that goals should be set by managers expressing again high power distance. Interestingly she (10) didn't mention anything about team goals but only individual goals that could be explained by her personal individualistic values. What it came to results, Indian analyst (5) wanted to have feedback if result was ok or not. Indian developer (10) pointed that regarding results it should not matter how long people spent time on getting those if the output was correct. This reminded us on agile principle of working software is the primary measure. Demand for concrete deliverables is typical in masculine cultures and therefore this statement revealed again the relationship between agile and masculinity.

Finnish UX designer (2) wanted to have realistic goals and money if those goals were reached thus having both feminine (modest goals) and masculine (money) sides in her answer. For Finnish developer (4) it was important to see concrete results and be proud of those results, which sounded more masculine values than anticipated. Finnish developer (6) proposed to have series of smaller, intermediate goals in order to secure good motivation. Regarding results, he (6) did not care so much about monetary rewards as long outcome was done with good quality and involved people were happy with it. His answers were quite typical for a member from high uncertainty avoidance (smaller and intermediate goals, security and good quality) and feminine (involved people happy) society. Finnish UX designer (8) required as clear goals as possible so that schedules could be properly planned indicating higher uncertainty avoidance. Results on the other hand were comparable to goals for her (8) and success was measured how many projects were done for the same customer.

Change is inevitable in software development projects. For Chinese developer (1) change was associated with *"hard to change, sometimes afraid of it"* continuing that he would have liked to make changes in projects through discussion. Similarly Chinese developer (3) continued that *"every developer and manager hates change during development"* and managing changes was team work. Reluctance towards change for both developers was surprising, since Chinese, being on lower side in the uncertainty avoidance dimension, would assumedly have been more willing to see changes. For Chinese developer (3) one explaining

factor was again her personal high uncertainty avoidance. On the other hand, making changes as a result of discussion by team was a sign of collectivism. Chinese team lead (7) was more open to change, seeing it as a good thing. She (7) continued that they were used to that changes happen. Her (7) only wish was to be informed early enough regarding coming changes.

Also Finns were consistent with their answers regarding change. Finnish UX designer (2) said that *"changes are welcomed when reasoned for people and inevitable"* and Finnish developer (4) continued saying *"change is a continuous process"*. Finnish developer (6) and UX designer (8) also noticed that working life was continuously changing. Therefore, changes should be taken positively instead hanging on old things. Regarding how Finns would have liked to changes to be done in projects, all of them required reasoning behind the change, possibility to influence on change and enough time to implement those changes. Finnish project lead (11) admitted that change was inevitable and therefore not a problem but needed to be thought carefully in advance. While some of their answers could have been influenced by agile values, signs of high uncertainty avoidance could be seen as they all wanted to have details about change and time to understand it.

Indian analyst (5) was very reluctant towards changes, which according to her were *"not acceptable"*. Her (5) and Indian developers (9 and 10) mechanism for handling changes required structure (formal change request), careful analysis, testing, documentation and approvals from board. This indicated high uncertainty, which was higher on their personal surveys compared with the averages in India.

As a summary, our assumptions did not hold what it came to planning and changes. Finns did not emphasise planning and were more open for change than expected from the members of high uncertainty avoidance culture. In contrast, Indian respondents required much more definitions, rules and other uncertainty avoidance mechanisms than expected and were very reluctant towards change. One explanation for these results was respondents' personal values for this dimension, which were lower than average for Finns and higher than average for Indians. Regarding goal setting, Chinese (with one exception) and Indian interviewees emphasised clear goals as we expected to happen with the members from masculine cultures. Same thing but not as clearly was seen when talking about results.

7.5.6 Devil Is in the Details

Keywords: design, documentation, process, measurement

Previous sections discussed about how team should be organized and motivated and how project should be planned. In this section focus is on another aspect that is often discussed in agile, documentation. Agile aims for lighter design, documentation and processes. On the other hand, this indicates that agile favours low uncertainty avoidance.

Regardless the nationality, developers shared common dislike for creating *documentation*, although many respondents paradoxically acknowledged importance of having it available for them. In that sense, we can predict very wide acceptance globally for the agile value promoting working software over comprehensive documentation. Both Chinese developers (1 and 3) coming from lower uncertainty avoidance culture expressed their feelings more strongly by saying that *"Chinese hate writing the documents"* and *"most of the documentation is useless"*, while Finns (2 and 4) were bit more positive by saying that *"it will be done if seen necessary"*. Chinese team lead (7) saw importance of documentation when transferring development responsibilities between teams and individuals. For her (7) it was especially important what it came to seeing big picture and rationale behind implementation decisions. Continuing with *design*, she (7) had noticed that the local (Chinese) team did not reserve much time for design before starting implementation. This was a clear sign of low uncertainty avoidance combined with masculinity driven by reaching given goals quickly.

Also Finnish developer (6) wanted to do as few documents as possible as he didn't see documentation very useful because documents did not reflect reality for him. However, regarding design he thought that it was an essential activity. For him (6) it was better to design software properly before implementation in order to avoid mistakes, which indicated high uncertainty avoidance. In addition, he (6) thought that documentation could help in the induction of new people in projects. Finnish UX designer (8) recognized importance of documentation in larger projects. Continuing with design, she (8) wanted to have as much freedom as possible but also regular feedback from others. Interestingly Finnish project lead (11) played down the importance of project documentation used in development phase such as plans, designs and reports but emphasised that results should be documented properly for

the needs of maintenance team. She (11) continued that this was often forgotten since project team members were thinking about documentation from their own perspective indicating individualistic values.

Indian analyst (5) differed from earlier answers as she was adamant what it came to importance of proper and detailed design and documentation before actual work was started. This was again bit surprising but her personal uncertainty avoidance could explain this statement. Indian developer (10) complemented this by saying that design was done after clear functional requirements were received and should be approved as well other documentation generated. According to her (10) documentation was good to have in case something went wrong. We could see indication of high power distance in her answer in form of approvals and cover your back mentality. Indian developer (9) defined design to be part of planning and required checklists to verify her designs demonstrating high uncertainty avoidance.

Processes are defined and standardized way of working and therefore were assumed to appeal for strong uncertainty avoidance cultures, which have an emotional need for rules. Both Finns (2 and 4) highlighted need for some structure and processes, which also leave space for own thinking and flexibility. This flexibility was also repeated in Finnish developer (6) answer although he added in case of multiple teams some rules and expectations for others should be defined. Finnish project lead (11) complemented previous answers by saying that *"processes do not relieve you from own thinking and taking responsibility"*. Finnish UX designer (8) felt that word process was used almost comically as everything was a process like getting a cup of coffee. In short, Finns showed less emotional need for rules as earlier thought. Once again, possible explanation for this was that their personal values were lower in uncertainty avoidance than in average at Finland.

Also Indian analyst (5) and both developers (9 and 10) thought that processes were important to have for alignment and clear goals and should have been followed. Again these answers indicated higher uncertainty avoidance and also masculinity in case of Indian analyst (5) requiring clear goals. Chinese developer (1) was more negative regarding processes saying that *it will slow us down* and for him most important thing was implementation. Chinese developer (3) was closer to Finns in her response where she said that *"every project need*

process" and it *"is better if process is stable between projects"* indicating higher uncertainty avoidance for her (3) than for her compatriots.

Measurement was added to keywords after first interview rounds. Therefore, answers for this keyword were lacking from Chinese developers (1 and 3) and Finnish UX designer (2). Measurement was assumed to have a relationship with power distance and uncertainty avoidance and on the other hand, working software is a primary measurement agile principle. First association for Finnish developer (4) was revealing: *"It makes you angry if there are too many measurements and it may result that results are optimized in order to reach those measured targets. Developers do not require too many measurements. Mostly they are interested of code analysis metrics rather than some dates"*. This phrase revealed many aspects. Firstly, sign of low power distance as he didn't like measurements, a method for control, hindering his work. Secondly, sign of feminine culture as opposed to masculine values which prefer clear, measurable targets. And thirdly, a sign of higher uncertainty avoidance as code metrics removed uncertainty related to code internal quality. Finnish UX designer (8) was more positive towards measurements as she saw them important when thinking of project goals and results. Finnish developer (6) didn't believe much of measurements, especially on measurements that tried to gauge team efficiency, since based on this experience these could be easily manipulated depending of what kind of message wanted to be delivered for management.

Indian analyst (5) did not show any emotions when asked about measurement. For her measurement process was setting parameters in order to know deviations and improving. This again showed need for clear goals that is a masculine value. As stated earlier, Indian developer (10) emphasized concrete outcome over measuring working hours, her answer being very close to agile principle.

Similar to previous section, we could not see clear relationship between documentation, design and high uncertainty avoidance, although there were some indications of it. As described in the previous section, this could be partly explained with personal values that differed from country averages. Chinese developers were exception to this since there were clear reluctance towards processes and documentation regardless their personal higher uncertainty avoidance values. Measurement was seen in general negatively by Finns, which expressed low power distance and feminine values if measurement was understood as control

mechanism and competitiveness between teams. Answers from Indian respondents surfaced masculine values requiring clear goals and concrete results.

7.5.7 Heureka!

Keywords: implementation, innovation

According to Hofstede's framework, nationalities with low uncertainty avoidance are good at *innovation*, while as countries with high uncertainty avoidance are better with *implementing* these ideas. However, for Chinese developers (1 and 3) any signs of pro-innovation could not be seen. In fact, developer (3) said that *"Chinese are not that good in innovation. For them it is hard to express new ideas, since they are afraid that nobody agrees them."* Based on this phrase, we could see that high power distance and collective values (not encouraged to speak individual ideas) suppressed innovativeness that could otherwise happen in a low uncertainty avoidance country such as China. Regarding how they would like implementation to be done, both Chinese were almost identical their answers that was following the plan. Their views was shared by Chinese team lead (7), who hoped for clear goals but also giving enough space during the process with requirement for developers to speak out potential issues and questions. Again, we could see masculine values (clear goals), her personal medium power distance and high individualism (speak out potential issues) in her answer.

Both Finnish UX designers (2 and 8) recognized innovation as a hype word that is wanted but often not given enough space or time to happen. She (2) thought that typically Finns wanted to ideate alone. She (2) continued that Finns would present their ideas to others only after they had found out something. This could mean individualism but also high uncertainty avoidance as details needed to be correct before publishing ideas. Her opinion was backed up by Finnish developer (4), who concluded that Finns were not very good at innovation due to lack of courage to bring new ideas and lack of self-critique for the ideas they had published. Hesitation to express ideas resembled Chinese developers' answers but in this case, lack of courage could be also due to feminine values (humility) or missing some details related to uncertainty avoidance. Lack of self-critique pointed out inability to change one's mind once that was settled, which was again a sign of high uncertainty avoidance. Finnish developer (6) even said that he had been forced to innovate but (not surprisingly) those sessions were never

successful. He believed more incremental and evolutionary approach regarding improvement. Indian analyst (5) could not find any common factor in her culture regarding innovation and she judged it to be more personal trait. Also Indian developer (10) thought similarly, although her description of innovation was more like series of small improvements in development process. This kind of improvement via smaller steps is more common in high uncertainty avoidance.

Finnish UX designer (2) response regarding implementation was revealing. She required development to *"have enough time for implementation so that there will be sufficient testing and unfinished work won't be released"*. Similarly Finnish developer (4) and Indian analyst (5) said that implementation was not done unless it covered testing and approval. Both answers emphasized reducing uncertainty by testing and approval and therefore were signs of higher uncertainty avoidance compared to their Chinese colleagues. Finnish UX designer (8) said that implementation required lot of co-operation, specifying and working together indicating feminine values and high uncertainty avoidance. Indian developer (10) defined implementation as results meeting requirements, this kind of clear goals being a masculine value. Indian developer (9) defined implementation as a result of careful planning and analysis, again indicating higher uncertainty avoidance for her.

To summarize this section, we did not see so much enthusiasm towards innovation with people from low uncertainty avoidance countries as we expected based on Hofstede's theory. Partly this could be explained by personal high uncertainty avoidance and partly due to fact that high power distance and collectivism hindered bringing out own ideas. It was interesting to see that Finns wanted to have more uncertainty removal mechanisms in implementation phase than their Chinese colleagues even their personal values were lower in this dimension. This could be learned behaviour or measurement error in personal survey done for this thesis.

7.5.8 Continuous Learning

Keywords: job improvement, learning

Learning and *job improvement* were supposed to have relationship with masculinity (purpose and outcome of learning) and uncertainty avoidance (reducing uncertainty with competence).

Therefore, it was assumed that interviewees from masculine cultures would stress on job content enrichment on their answers, while as in feminine cultures contact and cooperation would be appreciated. In high uncertainty avoidance cultures focus would be on increasing knowledge in order to remove uncertainty.

For Chinese developer (1), job improvement was something to be done also on leisure time, which pointed to masculine values. According to Chinese developer (3) job improvement was based on *"project manager pointing out what is good and what is bad"* indicating higher power distance. Learning for her (3) was done collectively together with other team members. Chinese team lead (7) said that first was needed to define what was target for learning. What it came to learning, feedback was way to do it for her but *"Chinese do not want talk directly with peers about improvement and especially on negative issues, since it could harm their relationship"*. Clear goals, indirect communication and relationships are important for masculine, high power distance and collectivistic cultures such as China.

Finnish UX designers (2 and 8) and developer (6) responded the purpose of job improvement was to continuously increase expertise and knowledge. Finnish UX designer (2) added that in this process Finns needed support from their managers. Finnish developer (6) also reminded importance of taking sidesteps in career, not only promotions. He (6) emphasised this by saying that *"if one does not learn other than current skills, you easily become useless"*. Considering learning, he (6) saw learning by doing as most efficient method. Their answers summed up high uncertainty avoidance (emphasis on expertise and knowledge) and feminine values (sidesteps in career). Finnish developer (4) approached job improvement from improving how things were done and well-being of employee. Again this aim for perfection reminded us from uncertainty avoidance and referring to well-being from feminine values. Finnish project lead (11) recalled that earlier learning had been done by mentoring, which she thought to be a good way.

For Indian business analyst (5) and developer (10) job improvement was based on learning and on timely feedback. This kind of empiricism is typical for low uncertainty avoidance. Indian developer (9) described job improvement via achievement and promotion showing masculine values.

We could see signs of national cultures what it came to job learning and improvement, although answers varied a lot for these keywords and results were not as obvious as with some other keywords. Generally, promotions and clear goals were mentioned by persons from masculine cultures. Respondents from high uncertainty culture highlighted increasing expertise in this context.

7.5.9 Work to Live or Live to Work?

Keywords: work

Sustainable pace, defined in agile principle, is assumed to happen more easily in feminine countries where people work in order to live. Chinese developer (1) amplified this assumption by saying that *"Work is very important. First priority in your life. We need to do overtime then we do overtime"*. Likewise, Indian developer (10) said that *"we should like our work and usually Indians do"*. Indian analyst (5) brought new angle to this keyword by saying that typical Indian work culture was hierarchical and in that people wanted to have promotions to more senior positions. This statement implied high power distance (hierarchy) and masculinity (status). Chinese team lead (7), defined *"work is needed to do for money and have a better life"*. She (7) continued that *"in China it is hard to link your interest to your work"*. This kind of separation between work and free time is typical in feminine cultures.

Completely opposite and almost by the book answer for feminine cultures was said by Finnish UX designer (2), who defined work to be *"an opposite to leisure time. Should be done suitably"*. She was backed up by Finnish developer (4), who continued that *"Work is only work"*, project lead (11) *"people work in order to get their living"* and Finnish developer's (6) distinction of work and leisure time. He (6) also added that in office he would work hard and as efficiently as possible indicating also high uncertainty avoidance. Finnish UX designer (8) was an exception in Finns, saying that work for her is must have and big part of life. Seeing these answers, we could conclude that sustainable pace will have a very easy buy-in in feminine cultures such as Nordic countries.

7.5.10 Impact of Agile

References to agile were reduced after the fifth interview, when word agile was removed from interview invitations and introductions. However, impact of agile culture could be still seen in many answers. For example when asked about change, Chinese developer (3) answered that *"in agile it will come"*. Agile itself does not generate need for changes, but is more open towards it and therefore might have explained her association with agile and changes. Similarly, Indian analyst (3) explained working software to be *"a product of scrum"*. Regarding planning, Finnish developer (4) referred directly to sprint planning sessions (from a methodology called scrum) and incremental planning (similar to planning game in another agile method called XP). Based on these answers, we could conclude that agile affects to people thinking, although national and personal values still defined how agile was interpreted in daily work.

7.5.11 Summary of Results

Effect of personal values, national cultures, agile culture and organization culture could be seen in many answers, while values were not consistent even for individuals. Person could express both sides of cultural dimension depending of the keyword asked. However, when we look interviews as a whole, we could recognize certain underlying values for individuals and nationalities. These interviews verified some of assumptions such as self-organization happened more easily in low power distance and individual cultures. On the other hand, sustainable pace and interactions between individuals were more natural for feminine countries. Relationship between planning and documentation could not be seen on national level but in those keywords personal values seemed to influence a lot. This is a good reminder that, although intercultural sensitivity helps us on understanding different nationalities, we should always keep in mind personal differences. This concerns also guidelines for agile adaptation for different national cultures.

7.6 How Agile Should be Adapted for Different National Cultures?

As a short recap, agile development seemed to favour low power distance, individualism, masculinity and low uncertainty avoidance. Following recommendations are written from the perspective of cultures where agile value might conflict. The purpose of these recommendations is to help people understand what is needed to take into account if they want to use agile with culturally diverse teams. For example, how agile should be adapted for members from a high power distance and collectivistic culture such as China. It is understood that these recommendations were written from the perspective of Finnish culture and therefore might be biased.

7.6.1 High Power Distance, Collectivism and Agile

Self-organization is a difficult concept for people from high power distance countries where hierarchy and clear roles are assumed. From their viewpoint, self-organizing teams with transient roles and no managers telling what to do feels chaotic and not motivating. Also collectivistic values prevent single team members to propose new ideas related to project outcome or way of working. However, self-organization can be gently forced in these cultures (and author understands the obvious paradox of previous phrase) by facilitative and coaching type of leadership.

In practice this means that command and control should be avoided by project managers and project members seen to be higher in hierarchy as it inhibit team members from high power distance and collectivist cultures to express their ideas. There should be possibilities in meetings for all team members to express their ideas, which can be ensured with direct questions for individual team members. It is also important to show people that their suggestions are heard and acted on as it encourages them to continue proposing their ideas.

Letting people to decide within how they do tasks given for them is usually a good start. If team members have problems or questions, replying to those with open or loaded questions help them to find answers but also encourages team members for own thinking and responsibility taking. As the level of self-organization increases gradually, more freedom and responsibility should be delegated to team members by letting them to choose tasks within

project goals. Ultimately, self-organizing teams actively participate in project planning and take self-initiative in case of problems.

Another efficient way of learning is to let team members fail in a safe way. Exact definition of what is failing in a safe way is very difficult but talking in general way those failures should not cause any physical, emotional or financial damage to parties affected by the failure. Also, creating an open atmosphere and feedback mechanisms where problems are surfaced is important when there are members from collectivistic and masculine cultures. This is because in these cultures, failing brings shame and therefore problems might be hidden. But failing is not enough. Repeating same error again is not wise and therefore people should learn from failures. Retrospectives and thinking tools like A3 [Poppendieck and Kniberg, 2009] are useful for facilitating that learning process. Again in this process, blaming, command and control and giving direct answers should be avoided as it inhibits self-organization.

Cultures with high power distance prefer having strict division of *roles and responsibilities*. This can prevent business people and developers working together, which can cause delays and misunderstandings in communicating customer needs to and within development team. This risk can be mitigated by not using or referring role descriptions in projects and actively encouraging team members to take on new duties and tasks within a project. If global teams are to be divided because of team size or other reasons, Fowler [2006] proposes to organize teams based on functionalities, not activity as the latter introduces more handovers causing errors and delays in the development. Lastly it is good to understand and take into account in budgeting that high power distance cultures expect hierarchy, which often means more people and costs regardless how agile that team or organization wants to be.

7.6.2 Agile in Feminine Cultures

Agile development seems to favour masculinity. However, for individual and team *motivation* customer's competitive advantage might not be the thing that makes members from these cultures to tick. Instead, members from feminine cultures need to understand that their work helps other people and is meaningful in general. Competition between team members is an area that can cause risks for global development teams. Masculine cultures see

open competition between team members as a good thing, which motivates them to perform better. On the other hand, members from feminine cultures can see this behaviour as trying to advance on own career at the cost of others. Therefore, good social skills and communication is needed from team members in order to prevent this risk to escalate as a dysfunctional behaviour between team members.

Group interactions are also important for feminine cultures. Fowler [2006] and Paasikivi and others [2010, p. 21] stress the importance of face-to-face kick-off and visit in the beginning of project as it increases team gelling and improves productivity. In the kick-off, opening up by discussing personal and national values and how those affect to way of working is important as it increases common understanding, openness and trust. This kind of discussion should be organized even virtually if team does not have a chance for meeting face-to-face.
After kick-off, relationships are reinforced by direct and frequent communications between team members using as much voice and webcams as possible this being closest to face-to-face communication. Using voice and instant messaging also decrease delays in communication and avoid misunderstandings common for written documentation and emails. Adding informal discussion to virtual team meetings and demos or even organizing unofficial virtual team gatherings as proposed by Hossain and others [2009] helps for building relationship between team members. This is especially important for collectivist cultures, where knowing each other before task is important.

What it comes to *decision making* in teams, members in feminine cultures want to be involved in the process as much as possible. On the other hand, decision making takes usually longer in these cultures. There should be room for group discussion in these cultures but having strict deadlines for decisions and agreeing persons who have responsibility for making those speeds up this process.

7.6.3 Agile in High Uncertainty Avoidance Cultures

Members from high uncertainty avoidance cultures tend to spend much time and effort on *planning*, sometimes risking goal of early deliveries. Some of this planning effort can be due to contract models and customer relationship but even within those boundaries, people from high uncertainty avoidance cultures want to remove ambiguity with spending more time on

upfront planning. Splitting projects and contracts into smaller, intermediate goals can reduce this emotional need and helps on starting actual work more quickly. Having this kind of smaller goals helps also on the reluctance towards change as it is easier to keep set goals in this kind of projects. Nevertheless, high level development roadmap should be also available in these countries as it reduces effectively uncertainty related to long term vision.

In contrast, national cultures with low uncertainty avoidance combined with masculinity are motivated by achievement. This means that these people also tend to stick with *set goals* better. However, in low uncertainty avoidance culture, it is possible that less time has been spent on planning thus estimating if the goals were realistic in the first place. As a consequence, if project's goal is to produce certain functionalities in a given time, quality can suffer. This affects especially on internal code quality that is not visible for customer or end users. Some ideas to mitigate this risk is to define together with the team what done means, giving enough time for estimations, asking rationale for estimations when team is committing for goals and not pushing goals for the team.

Also *design* can mean different things depending of if a team member is from low or high uncertainty avoidance country. For members from high uncertainty avoidance countries, design phase can mean more design documents, which inevitably take more effort and longer time to do and jeopardize early deliveries. Using time and money for limiting this activity is an efficient mechanism to handle this risk, although it is good to understand that this can also cause job dissatisfaction and stress. When looking from the low uncertainty avoidance perspective, risk they encounter is not making enough design which can be counterproductive in a long term. Regarding what is a right amount of design, it is a question that author can't or won't answer in the scope of this thesis.

Regarding *processes* and *documentation*, high uncertainty avoidance cultures tend to produce formal rules and regulations in order to reduce uncertainty but also to provide emotional safety, although this was not seen in project member interviews. As controversial as it may sound, having documented agile processes and instructions in place can help introducing agile for high uncertainty avoidance countries. However, as team matures some of these processes or documentation might not be needed anymore and therefore should be actively challenged as time goes by. It is still important to keep in mind that because of lacking possibility for face-to-face communication, distributed teams need by default more

documentation compared with co-located teams [Fowler, 2006]. Additionally, moving documentation and processes from static documents into wikis helps on reaching goals of self-organizing teams and lightweight processes. These tools still provides enough details for team members from high uncertainty avoidance cultures and they are always capable of adding more documentation if they feel like it.

7.6.4 Be Patient

As reader can understand based on the given examples above, adopting agile values to different national cultures is not a simple task taking time and costs. This has been also noted by Fowler [2006] who writes *"getting teams to be more pro-active is an uphill battle, and one that inevitably takes a lot of time."* Consequently, decision for going agile and global development should be done based on long-term benefits, not on a short-term profit. When this decision has been done, enough patience should be exercised what is comes to adopting agile and expecting results. Shortly, if your visibility and prospects are only few months ahead for a small team, don't go for global and agile. And when you have made that decision, moving from co-located teams to global software development should be done gradually, not with big bang, as it helps with the cultural challenges and reduces risks [Hossain et al., 2009].

8 CONCLUSIONS

In this thesis relationship between agile values and national cultures and how it affected to the way of working in global software development teams was studied. Analysing national values was done with the cultural dimension framework by Geert Hofstede (Section 3.5). Cultural dimensions were then compared to agile values and principles with the help of literature (Chapter 4) and cross-cultural expert interview (Section 6.2). Based on this, assumptions on the relationship between agile and national cultures were created. Agile seemed to favour individualistic and masculine cultures, which have low power distance and do not actively avoid uncertainty (Section 6.3). Cultures closest to agile values were found to be *Anglo-Saxon* countries, whereof agile originates, and *Nordic* countries (Section 6.3). For most of the countries in the world, accepting agile values and principle is assumed to take longer time and higher effort due to that these countries have high power distance and collectivism as driving values. However, agile can also work for these countries if adapted correctly with local values (Section 7.6).

This relationship between agile and national cultures was also seen in interviews with project team members (Section 7.5). For example, people from high power distance and collectivist countries explained self-organization through hierarchy, management and discussing in groups. Based on this, we could conclude that self-organization does not happen easily in these cultures, although with facilitation and coaching this transition can be smoother. On the other hand, people with high uncertainty avoidance values emphasized more on planning (Section 7.5.5), design (Section 7.5.6), testing and other ambiguity removing activities when discussing about software development. For them jumping into unknown with less planning and documentation was an issue. One interesting finding in these team member interviews was that personal values seemed to be stronger than national values (Section 7.5.11). This was most evident in uncertainty avoidance dimension where interviewees' answers differed on what was assumed based on country's averages but were aligned with the results from personal survey (Appendix 3).

To sum up, this thesis provided many new insights into a topic that has been studied in organizational level but not on a specific group culture that agile development represents. This knowledge is not only important for software professionals who work in agile global delivery projects but also for managers who plan and decide where and how development

should be done. After all, cultural differences often cause misunderstandings thus hidden costs in global software development (Section 2.5).

8.1 Comparing Results with Previous Studies

Also Sutharshan and Maj [2011] and Vodde identify [2010] relationship between agile and Hofstede's cultural dimensions. However, Sutharshan and Maj do not provide any research methods or rationale how they have had reached their conclusions, limiting validity and reliability of their results.

Vodde writes that agile favours low power distance, low individualism, low masculinity, low uncertainty avoidance and long-term orientation. While, we could agree with him regarding power distance and uncertainty avoidance, relationship between agile and other dimensions was found to be different in this research. One explanation for different results was using different research methods. Vodde uses survey as a research method, although he also opts out the actual survey questions from his results. Analysis of results is based on his interpretation but that process is not thoroughly explained in his presentation. Additionally Vodde's work is a presentation, not an academic research missing peer review and other mechanisms ensuring scientific reliability.

In this research, the main data collection mechanisms were interviews. Analysis of the relationship between agile and national cultures was done with the help of cross-cultural expert, who could provide deeper insight into topic and increased objectivity of conclusions. These assumptions were revised in the next round interviews done for case projects and team members. This research solved limitations of earlier research by describing research methods and rationale from collecting data to analysing results in a transparent way. In this way, future research around this topic has now more solid base to continue with.

8.2 Limitations and Future Work

Due to the qualitative nature of this research, personal bias could have influenced to the analysis phase. As an example of this bias were author's previous experience as a project manager for a global delivery team and national and personal values. In order to reduce this

personal bias, future research could be done with more authors coming from more diverse professional, educational and national background.

In addition, because of limited sample size, relationship between agile and national values could be only identified but not verified. Therefore, hypothesis about *agile favouring low power distance, high individualism, high masculinity and low uncertainty avoidance* needs to be investigated in future studies using *quantitative* research methods. Some possibilities for these methods are creating own web surveys with increased sample size or making data analysis on the already collected data such as World Values Survey [2013].

Another limitation of this research was that it included only few countries from selected clusters. It would be interesting to include more countries inside specific cluster and countries in new clusters. Could the same relationship between agile and cultural dimensions seen also in these countries? Also since interviews were done within one case organization, this thesis missed how strongly organization culture affects to agile adoption. Which one prevails if there are conflict of interests between national and company values? Continuing with case organizations, also more case projects studied with different research methods such as observation can be included in the future work.

Future work on this topic can also include more research questions. As an example of this kind of question is that how it is possible that same Anglo-Saxon culture produces so different ideas such as traditional waterfall development and agile? Is it due to differences in time or in individual and organizational values? Since this topic is quite new, there are still many things to uncover in this area.

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APPENDIX 1 – QUESTIONS USED IN CROSS-CULTURAL EXPERT INTERVIEW

Questions asked in cross-cultural expert interview. With word this, specific agile value or principle was referred to.

1. How this is related to Power Distance?
2. How this is related to Individualism?
3. How this is related to Masculinity?
4. How this is related to Uncertainty Avoidance?
5. How this is related to Long-Term Orientation?
6. In general how agile values and principles correlate with national cultural values?

APPENDIX 2 – KEYWORDS USED IN PROJECT MEMBER INTERVIEWS

Keyword	**Assumed Relationship with Cultural Dimensions**
Change	Uncertainty Avoidance, Masculinity
Collaboration	Individualism, Masculinity
Competition	Individualism, Masculinity
Communication	Individualism, Masculinity
Conflict	Individualism, Masculinity
Decision	Masculinity, Power Distance, Uncertainty Avoidance
Design	Uncertainty Avoidance
Documentation	Uncertainty Avoidance
Goal	Masculinity, Uncertainty Avoidance
Implementation	Uncertainty Avoidance
Innovation	Uncertainty Avoidance
Job improvement	Power Distance, Individualism and Uncertainty Avoidance
Management	Power Distance, Masculinity and Individualism
Motivation	Masculinity, Uncertainty Avoidance
Planning	Uncertainty Avoidance
Process	Uncertainty Avoidance
Result	Masculinity, Uncertainty Avoidance
Self-Organization	Power Distance, Individualism
Trust	Power Distance, Individualism and Uncertainty Avoidance
Work	Masculinity

APPENDIX 3 – PERSONAL VALUES SURVEY

Personal values survey used in project member interviews to evaluate how close respondent is with country averages [ITIM, 2011]

INSTRUCTIONS: Please mark x to the column that represents your opinion best for certain claim						
Example only	***1***	***2***	***3***	***4***	***5***	
Children in families learn that their opinions are as important as their parents		*x*				*Children in families learn that they should not question authority of their parents*
Children in families are encouraged, that they do not take things for granted					*x*	*Children in families learn to accept what parents or more important people are saying*
I feel myself most familiar in a country where:						
PART 1	**1**	**2**	**3**	**4**	**5**	
Children in families learn that their opinions are as important as their parents						Children in families learn that they should not question authority of their parents
Children in families are encouraged, that they do not take things for granted						Children in families learn to accept what parents or more important people are saying
In work, subordinates are expected to define their own tasks and place in organization						In work every employee has clearly defined responsibility area
In work, people question and challenge their leaders continuously. It is often difficult to say who is leading and who is to be lead.						In work it is leader who makes decisions, supervises and manages with great precision. People accept this as a part of leader's role and because of respect towards the leader.
People believe that political systems can be most efficiently changed gradually by discussion and voting.						People believe that political system can be most efficiently changed by changing people having power

PART 2	**1**	**2**	**3**	**4**	**5**	
People are very loyal to their long-term in-groups						People choose their friends based on common interests and preferences
Social pressure and control can be found in community						Loneliness and freedom can be found
People want to avoid losing face and save also others from this to happen						People want to follow their personal norms and requirements
Promotions are achieved based on loyalty and seniority						Promotions are achieved based on good results regardless the age
It is consider immoral if leaders do not use their power to organize job for close relative who needs it.						It is considered immoral if leaders use their power to organize job for close relative needing for it.
PART 3	**1**	**2**	**3**	**4**	**5**	
People feel compassion towards weaker and try to protect them.						People admire successful people and wonder why people having less do not achieve so much.
People in work are motivated by pleasent working environment, nice colleagues and supporting leaders.						People in work are motivated by clear goals and personal responsibility so that they can show their personal achievement.
In work people are expected to collaborate and not to compete visibly with colleagues.						People consider competition positive and fruitful. Competition brings best out of people.
Both men and women are expected to behave in a same manner.						Men are expected to behave like men, and women are expected to behave like women or compete with men in men's world.
Lovers express their private thoughts and feelings to each other.						Lovers seek for emotional support from each other in hard world.

PART 4	**1**	**2**	**3**	**4**	**5**	
Children learn to live in chaos and uncertainty in families.						Children learn to create order and avoid uncertain situations in families.
People prefer generalists who can survive in all environments.						People prefer specilists and competent leaders.
People do not need to carry personal ID card with them.						People are required to carry personal ID card with them.
People are not expected to show their emotions publically.						People are allowed to show their emotions publically (in right place and time).
There are only few rules in society that everybody must follow.						There are many rules in society, which of others need to follow.
PART 5	**1**	**2**	**3**	**4**	**5**	
People know clearly what is good and what is evil.						People work for the common goal without thinking much of good and evil.
People emphasize personal solidity and stability.						People emphasize that everything is variable and relative.
Children are teached to ask why.						Children are teached to ask what and how.
People often refer into their roots and history.						People can act for goals happening after hundred years.
People seek for consistency from information they have received.						People can live with conflicting information.