UNIVERSITY OF GOTHENBURG

THE PARALLEL SYSTEM OF LEARNING

An exploration of white-collar workers practices for developing new skills in a fast-changing business environment.

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Essay/Thesis:	30 hp
Program and/or course:	Strategic Human Resource Management and Labour Relations
Level:	Masters/Second Cycle
Semester/year:	Spring/2019
Supervisor:	Maria Jose Zapata Campos
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Abstract

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Purpose: The purpose of this study is to examine how white-collar engineers within high tech firms navigate and respond to the demands for competence development under external pressures brought by advanced technologies.

Theory: This study is based on the theoretical understanding of the mechanisms and dynamics of learning and developing new skills at work. The theory of situated learning and community of practice provides framework for the analysis as it examines learning as a social phenomenon, highly situational and embedded in context & social practices. The theory provides an indepth, critical and nuanced approach to analyse practices of learning and developing skills not just based on the employee level but also group and organisational level.

Method: The study applies a qualitative research method and empirical findings based on a case study and semi structured interviews.

Result: The study revealed that in changing business environment, individual practices (self-leadership, entrepreneurship, knowledge seeking and learning by doing) and group practices (virtual collaborations, team learning, learning with key experienced persons, helping others practice) were critical and shaped employee's ability of developing new skills. All these practices were important as employees develop their own informal system of learning in parallel to the formal system created by managers.

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1. Introduction

Prior to these times of technological advancement, a career often spanned throughout one's life span as individuals mostly spent their lifetime performing one specific job and in one organisation. Nowadays, with increased globalisation and digitalisation, individuals experience three or more careers in the span of their working life (Selart & Johansen 2017). Digitalisation is continuously changing working life, while these digital transformations have implications in the form of new business models, customer offerings and increased productivity (Legner et al 2017). It also has implications for careers and competencies (Lent 2018). This new scenario brought by digitalisation raises an important interest and question about how employees make required and continuous changes in their skills and employment to keep their careers ongoing (Freddi 2018).

Yet, digitalisation is not the only trend making the business environment become more complex and uncertain. Consumers demand new solutions that adapt to technological advancement while their needs are constantly changing (Urbach et al 2018). Products are expected to be delivered quickly and with high quality. High-tech firms have become disruptive and constantly coming up with new innovations to remain competitive (Matt et al 2015). Also, organisations are introducing the agile ways of working. This adoption of new ways of working agile is to attain heights of apt and flexibility towards customer needs and requirements while maintaining the highest level of productivity (Levy & Hazzan 2009). As a result, employees are challenged to perform at a higher speed while facing the pressure to remain innovative and creative. However, without adequate support and development opportunities employees may experience stress (Schwarzmüller et al 2018), which results to frustrations amongst employees leading to increased employees turnover within high-tech firms since employees consider development opportunities as the highest priority when looking to remain with an employer (Eva et al 2009). Thus, the need for organisations to gain further knowledge on various competence development strategies and how to enable good learning conditions to support employees.

Moreover, the challenges prompted by digitalisation is not only changing the way that people work but also how knowledge spreads and becomes obsolete. Individuals need to update their knowledge on a continuous basis to remain up to date with these changes (Vemić 2007). According to Wolffgram et al. (2018), the high-tech sector is continuously influenced by technological advancements such that tech workers need to learn continuously in a progressive

manner since they may be moved between tasks, functions, and jobs, which demands different kinds of skills and knowledge. Organisations seek ways to retain the best talents through development opportunities and for competitive advantage. Meanwhile, there's an increased war of talent as several organisations are competing for the best talents. Thus, human resource development (HRD) has become critical not only for employees careers and health but also for organisational productivity since employees competencies are integral for dynamic capabilities.

As a consequence of this need for new competencies, and the increasing complexity for human resource development managers, organisations are investing considerable resources on training. According to Borzykowski (2017) in 2016, 359 billion dollars was spent globally on training. Also, Sweden has received over 6.3 billion SEK between 2007 - 2013 from the European Social Fund for workplace learning and adjustment to changes in the labour market (arbetsplatslärande och omställning, 2011). They are responsible for finding ways of improving the competencies of people at work. The report argues that the challenge remains to find training that benefits both individuals and organisations in the form of improved job performance (Ibid). In the same vein, Budiningsih et al (2017) added that several formal training courses are not adapted to employee's needs in which training interventions adopted in times of digital transformations had no impact on job performance since such training today are two times behind the skills needed to perform advanced technological roles and tasks (Budiningsih et al 2017). Hence, employees in practice seek ways to navigate their skills development in the face of new technologies.

Researchers like Shahlaei et al (2017) & Jääskeläinen (2015) have studied the impact of digitalisation on the development of work-related competencies and illustrated that digital transformations have led to a fluid and fast-changing context which requires new competencies such as analytical thinking and social skills. Hjelm (2018) investigated how managers are navigating the changing environment and argue that they often respond reactively when dealing with employee's development. Tikkamen (2002); Schuchmann & Seufert (2015) have studied workplace learning in SMEs and technology-intensive business environments and illustrated that the main incentives to learning were the advancement of working digital amenities and the content of work in itself. The existing literature is however inconclusive and has underexamined with few exceptions (Baukal et al 2017; Reich et al 2015) how white collar engineers at the forefront of cutting edge technologies and managing complex projects navigate

developing new skills under external pressures of advanced technologies. Thus, by taking a practice and situated learning perspective, this study will examine how white collar engineers navigate developing new skills in a constantly changing business environment and highlight the practices they develop to address development needs.

Purpose & Research questions

Thus, the purpose of this study is to examine how white-collar engineers within high tech firms navigate and respond to the demands for competence development under external pressures brought by advanced technologies. To attain this purpose, the following research questions will be explored:

- How do highly-skilled workers navigate developing new skills and knowledge in a constantly changing business environment?

The main question is subdivided into two sub-questions:

- In what ways does management provide conditions that facilitate learning and development?
- What are the practices developed by employees to address development needs?

The content of this thesis is divided into six main sections precisely, previous research, theoretical framework, methodology, results, discussions and conclusions. Each section begins with a short introduction of what it will examine.

2. Previous Research

This section presents and critically discusses previous studies on competence development. First looking at the changing nature of jobs, next on the impact of technological advancement on competences, thereafter, follows a short definition and debates about competence development. Next, previous findings on different learning strategies by employees are presented and lastly, discussions about learning environments are presented.

2.1. Changing nature of jobs

Studies on the impact of technological changes on jobs go back in time. Previous research in the nineteenth century showed that past industrial revolution led to job polarization and wage differences. Studies showed that there was an increased demand for highly skilled workers to occupy new job roles while low- skilled workers were displaced (Tinbergen's 1975). Studies in the twenties century found an increased rate of wage inequalities and unemployment which led to the need for further training of workers at that time (Acemouglu 2002). Moving on to the 21st century, modern studies around technological advancement impact on jobs has sparked several debates and tons of research seeking to understand the implications of these rapidly increasing technologies. The development of these new technologies also referred to as the Fourth Industrial Revolution is unfolding the adoption of new technologies such as artificial intelligence, deep learning, big data and internet of things (IoT), etc. These new technologies are mostly characterized by advanced use of data and a high volume of software. It is said to speed up production processes which lead to the development of new business models and moving into new markets (Legner et al 2017).

Arntz & Gregory (2016) addressed the concerns that were growing as a result of the findings of previous researchers and how several occupations were at risk in the US and Europe. They insist that the earlier studies have all adopted an occupational perspective as initiated by Frey & Osborne (2013) which argues that a complete occupation will be automated rather than specific job tasks. Arntz & Gregory (2016) argues that people in the same occupation often perform very different tasks, thus the occupational approach is misleading. Hence, Arntz & Gregory (2016) adopted a task-based approach and conducted research to understand the possibility of jobs been automatized amongst 21 OECD countries. The study found that only 9% of jobs could be automated as opposed to 45% of occupations. Also, technological

advancement is more likely to create new jobs as there will be more possibilities of new business models, customer offerings and highly skilled workers will need to learn in a continuous manner, since at the forefront of the actual development (Arntz & Gregory 2016). Meanwhile, previous researchers found that the high-tech sector will experience increasing needs for soft skills since technological advancements will bring about more need for collaborative learning and knowledge sharing which to be able to maintain such context, employees will require more soft skills to build and maintain good relationships with others as well as leadership potentials (Wolfgramm et al. 2018).

Furthermore, more recent research by the World Economic Forum (2018) with a timeframe of 2018 – 2022, presented a positive outlook on the implications of advanced technologies by emphasizing that new technologies will lead to the creation of high-skilled jobs and improved job productivity. The results show that about 75 million jobs could be replaced through tasks that can be performed by both humans and machines but 133 million new jobs would be available by 2022. The new jobs will see an increasing need for engineering functions such as data specialists, software developers, scientists, etc. wherein there's current talent shortage. Also, job roles that require people skills such as sales, etc. However, for all job roles, there'll be an increasing demand for soft skills which includes creativity, innovation, analytical thinking, problem-solving and emotional intelligence, leadership and social skills. The paper called on the attention of government, educators towards helping to enable more skills development and learning at all levels while encouraging a society of lifelong learners (WEF 2018).

2.2. Advanced technology & competencies

Previous studies around the implications of technological changes on competencies go back in time. The twentieth century was about "skill-biased technological change". Workers engaged in retraining and upskilling which led to an increase of skilled workers and complementary to technologies (Tinbergen's 1975 & Acemouglu 2002). Previous research by Greenwood & Yorukoglu (1997) argues that competencies played a significant part in the integration of new technologies during the past industrial revolutions. While the period witnessed continuous growth in the adoption of technological innovations, the era was also referred to as "an age of learning".

Furthermore, previous research based on multiple case studies showed that employees and managers experienced changing functions and tasks during ongoing innovations and digital transformations. Both employees and managers faced difficulties to be able to perform these new roles and responsibilities because learning opportunities and options were not adapted to these new changes. As organisations must remain innovative so also do employees and managers, hence the increased pressure perceived by both parties (Schuchmann & Seufert 2015). Meanwhile, the study found that employee development was perceived by the respondents to be a key leadership responsibility which meant that they had certain expectations from their managers to provide recommendations and support of what types of development opportunities to follow to reach work demands. Hence, managers support for learning and development is integral and critical. Thus, in the absence of this, employees experienced more frustrations. Employees were expected to have the capability to quickly adapt to changes as a "usual work mode". The ability to adapt to changes becomes critical to navigating careers in times of technological transformation (Schuchmann & Seufert 2015). In the same manner, previous research by Bonnici & Cassar (2017) adopted the career adaptability theory to further illustrate the importance of employee's ability to adapt to the contextual work environment and changes at work. The career adaptability refers to the ability to develop rapidly to deal with job roles that are explicit but readily adjust to changes in job conditions and job complexities. Career adaptability is a combination of individuals traits such as self -leadership, self – efficacy to initiate and learn to adapt. Also, the ability to make the right career decisions when required (Bonnici & Cassar 2017; Bocciardi et al 2017).

In addition, earlier research applied a quantitative analysis to determine the influence of training intervention on work performance in the era of advanced technologies and found that training interventions had 45% impact on employee's competency but did not indicate any impact on the transfer of such knowledge towards improving performance and work outputs (Budiningsih et al 2017). The study found that the competencies required to carry out advanced tasks brought by digitalisation were not provided by such formal training because most of those training today are two times backward on advanced technological skills that are required. Thus, the skills gained from formal training are not updated or advanced enough, hence, making them less suitable for the new skills needed to successfully carry out jobs (Budiningsih et al 2017). This confirms the findings of previous studies that training interventions are very costly not just about money spent but more critically the time involved and spent on the training which could

have been used for more productive work. Meanwhile, transfer of formal training showed little effects on job performance, usually between 10 -20% (Baldwin & Ford 1988 in Budiningsih et al 2017). This causes stress on employees since time has been spent taking those formal training yet no possibility to improve performance (Budiningsih et al 2017).

Furthermore, Wolffgram et al. (2018) argue that tech workers may need to be moved between tasks and jobs which demands different kinds of skills and knowledge as new technologies such as machine learning is introduced at work in the future. HR practitioners seek ways to optimize employee's knowledge and enable learning between groups, tasks, and jobs. Also, external collaborations and opportunities with other parties such as companies, institutes and experts outside the organisation for more knowledge transfer, innovations and collaborative problem solving (Wolffgram et al. 2018).

2.3. Short definition and debates on competence development

To provide some background information about the subject area, it is relevant to present a short definition of the concept. Competence development is one of the branches in the field of human resource development amongst others such as succession planning, mentorship, coaching, etc. According to Hall & Mirvis (1995) in a continuously and rapidly changing business environment, competence development opportunities is a critical and vital part of workers career journey and for organisations to function effectively. Competence development refers to ways by which individuals develop and acquire new skills and knowledge to be able to perform today's job efficiently and for future jobs and employability (Ibid). It also entails how organisations enable employees to acquire the skills needed to perform their jobs and prepare them for future tasks and functions. In this study, two main aspects of competence development are in focus, they include formal and informal learning systems (Ibid).

Earlier studies have been analysing these two forms of skills development. Just before the ninety centuries, competence development mainly concerned formal learning. Formal training conducted through external courses, conferences, seminars or in collaboration with educational bodies or training institutes. This method involves mainly having an instructor-led setting and allocating specific timeframes to get courses completed. It could also be held internally within organisations or other specific locations. However, in recent times, these formal methods have been integrated into E-learning platforms which are online based training with many websites in form of institutions, offering courses that can be taken at different time options and graded

in the end. In addition, expected learning outcomes or results are in most cases well known before the formal learnings are implemented (Eraut, 2000; Malcolm, Hodkinson & Colley, 2003; Marsick & Watkins 2001 in Baert & Kyndt 2013).

Meanwhile, a huge number of previous studies have been conducted to determine the impact of formal training on employee development. While many researchers found that more attention is been paid to E-learning platforms as opposed to traditional forms of classroom learning (Spaan et al 2016). There is still an increasing debate about the impact and effectiveness of formal training on employees and the actual learning outcomes (Ibid). Findings by earlier research in a quantitative study showed that instructor-led training offered to workers was not rated high amongst factors contributing to improved learning outcomes (Ha 2008). What received the highest was rather learning through work experience. The knowledge acquired from formal training was said to be quickly forgotten and relatively too easy in relation to the actual task performed (Ibid). Nevertheless, it was acknowledged that formal training is useful during the adoption of new technology. Formal training was considered most effective when accompanied by practical examples or cases where employees already had some practical experience with the technology or processes been taught. Studies showed that such training was also effective when followed up with informal forms of learning such as peer-peer interactions and feedbacks (Ha 2008; Spaan et al 2016).

On the other hand, previous researchers have also been discussing progressively in recent times about informal learning. The debate goes on arguing if informal learnings are more impactful than formal training (Markick & Watkins 1992). According to Markick & Watkins (1992) informal and incidental learning refers to those learnings that occur external to formal platforms, they often happen in unplanned and unintended ways and grows out of learning from experience or self-directed learning. The difference between informal and incidental learning is that incidental ones take place while completing tasks, collaborating with others, learning from mistakes by trails, and error (Markick & Watkins 1992). Thus, previous studies show a shift of competence development practices moving towards blended learning which involves both formal and informal learning (Ellström & Kock, 2011).

2.4. Learning strategies and employee development

Previous studies have been investigating learning strategies and responses to development needs from different perspectives and approaches. From a process-oriented perspective, earlier researchers found that work and learnings are intertwined and learning embedded in practices, thus, showing that learning and development were mostly attributed to performing the job: learning by oneself, through interactions with colleagues and virtual communication both within and outside the working environment as described by the study (Collins 2004). In a similar manner, previous research studied learning by adopting the practice theory perspective which centers on the practice as a point of study as opposed to individuals cognitive or behavioral characteristics (Reich et al 2015). The study explored the shared practice amongst workers, such as review meeting and site walks and found that it was through such practices that learnings occurred which were in form of social-material, embodied relational and emergent unanticipated happenings (Ibid). By socio-material, the authors meant the different tools that designers work with ranging from drawings materials to tools and even systems, etc., and that learning took place from daily usage of these materials (Reich et al 2015). By relational, the authors mean the interactions that take place daily within teams as well as with other colleagues or experts. However, not excluding other external networks of people in which people interact with and can learn from. Lastly, by emergent unanticipated happenings, this refers to sudden events experienced at work that sparks knowledge increase often not planned or intended, it could also be in form of trying out new ways of dealing with problems and learning from them. Hence, the study concluded that workers learn basically learning through "practice of practice" (Reich et al 2015). In addition to that, in the review of literature, Toiviainen et al (2012) argue that learning is rather emergent and embodied essentially in practice: knowledge as a way of doing things and using materials as opposed to just spoken or textual portrait in form of a captured phenomenon (Ibid).

Furthermore, earlier studies based on a quantitative approach found that employees learning strategies that showed high influence on their development includes intrinsic, extrinsic contemplations and asking for help from others. The study found that learning approaches were influenced and differed by years of experience and educational qualifications (Haemer et al 2017). Meanwhile, another study examined learning strategies by years of experience: entry

level professionals and experts. The study found that both parties approached learning differently. Entry level professionals focused more on building concepts, understanding work context, and assimilation. Learning mostly through formal opportunities such as reading instructions, taking specific courses and going through formal documents. On the other hand, expert professionals adopted more learning through informal ways such as consulting with mates within the same professional field. Experts described their learning experience as self-focused skill development, learning from mistakes, through conversations and sharing with others (Daley, 1999).

Previous studies investigated learning within technology-driven SMEs and argued that a key driving force is the need to continuously learn about changing work tools, technology, work processes, external stakeholder's requirements and benchmarking other fast-growing companies to remain competitive. The study found that employees perceived knowledge development in a varied manner. First, in relation to the work and second, connected to one's professional age. Differences were found between the engineering and banking sector, in the latter, workers experienced high learning demands in relation to competing for customers, adapting to changing laws and legal holdings. Hence, the workers invested more time learning to understand these changes through various formal means. For the former, it differed by years of experience: more experienced engineers did not perceive their job demands as high or requiring new learnings on a continuous basis, rather about adapting to new ways of working, adopting new processes and having to deal with tools and technology, younger engineers experienced rather the need to learn daily (Tikkanen, 2002).

2.5. Learning environment

According to Ellström (2011), learning culture and environment also impact employees learning and development. The notion entails conditions in organisations which facilitates or impedes learning. (Ellström 2011; Fuller and Unwin 2004). These conditions vary between work practices, work organisation, and learning facilities, etc. Earlier studies described organisational characteristics that may facilitate or impede learning to include: learning and development opportunities, job design, task allocation, problem-solving opportunities, employee involvement in competence development endeavors, time management, management support etc. (Fuller and Unwin 2004). In the same vein, quantitative research reveals that the learning environment is affected by the type of competence development strategies adopted by

organisations. In situations where it is mainly formal systems, the learning environment showed a low significant impact on learning outcomes by employees. But in an organisational context with the combination of both formal and informal system in the form of integrated strategies, learning environment showed a significant impact on learning outcomes. Thus, the authors stressed that employees experienced more learning outcomes in an enabling learning environment and fewer outcomes in an impeding learning environment (Ellström & Kock 2011).

Meanwhile, another research revealed that employee's perception of a supportive learning environment was linked to motivation. Individuals with low motivation to learn indicated a negative association to a supportive learning environment compared to employees with high motivation to learn which showed a positive association to a supportive learning environment. Hence, employees with a lower motivation indicated less interest in the demand for learning therefore less commitment to organisations with so much emphasis on learning (Maurer & Lippstreu 2008). Another researcher studied the relation between the individual learning experience and work culture. Using a quasi-experimental research method, the study showed that individual characteristics such as behavior, norms, self-decision making, and self-efficacy influenced the response and participation in various learning opportunities. In the review of previous studies, the study added that increasingly, the job context demands more generic competencies and broad skillset which are flexible and adaptive especially in business environments that are constantly changing as opposed to standardized skills in relation to specific work challenges (Renkema 2006; Baert & Kyndt 2013). This gridlock has resulted that organisations are now turning more towards employee-driven human resource development. This new system is laid on the foundation that each employee masters and be leaders of their own knowledge expansion. Careers are no longer a monotonous affair but more of an ongoing learning process, thus employee's self-motivation and quest to know further are more important than organisational strategies and practices but that learning can be reached through attaining a common interest from both employees and organisations. (Keursten, 1999: Van der Waals, 2001 in Renkema 2006). Thus, employees experience has become more adaptive to each work context but also shaped by individual learning ability and behaviour. (Renkema 2006; Baert & Kyndt 2013)

3. Theory

In this section, the theoretical perspective adopted for analyzing the empirical data presented. The following theories have been combined to reach the purpose of this study: situated learning by Lave & Wenger (1991) and communities of practice by Wenger (1998). The rationale behind the chosen theory will be presented, thereafter, the theory of community of practice. Lastly, the critique on the theory of communities of practice.

3.1. Rationale behind chosen theoretical framework

Lave & Wenger (1991) situated learning and community of practice emphasizes that learning happens as individuals experience daily activities either consciously or unconsciously. It is laid on the perspective that learning happens anywhere, in daily work life and most especially within communities. This theoretical perspective is relevant to this study because it focuses on how learning is situated and embedded within social practices. It draws an in-depth overview of how employees learn by engaging in communities of practice and the informal and unconscious educations that are acquired. Therefore, the theoretical framework enabled the researcher carefully examine and specifically focus on how employees navigate and react in response to demands for competence development in a given situation, community, and context. Meanwhile, considering the huge focus of current studies on learning as an individual process that has a start and finish and best detached from daily activities, also learning outcomes based on only the individual level (Wenger 1998), by using this theory, this study has examined how learning takes place on different levels individual, group and organisation level, and how the social context shapes learning. The choice of theories is also a good fit as it emphasizes its relevance for companies that are continuously required to adapt to an uncertain external environment.

3.2. Communities of practice

Communities of practice theory come from the theory of situated learning as developed by Lave & Wenger (1991), and originates from the perspective of the social learning theory which argues that learning is a social phenomenon embedded in the social context, practices and occurs everywhere (Wenger 1998). The theory explains that learning takes place through participation in a specific social context and such social context are referred to as communities. According to Wenger (1998) communities of practice (CoPs) are a group of people who share

a common interest and concern for a specific area or field that they work with and learn how to perform better by continuously interacting with each other for example engineers, doctors, etc. Learning is situated in the practices of the community. Also, organisations may be regarded as a social context comprising of communities Wenger (1998). In addition, newly recruits experience learning from more experienced persons within the communities through continuous dialogues, knowledge sharing and knowledge transfer (Wenger & Lave 1991). Wenger explains three main aspects of CoPs which include practice, community, and domain. These aspects are further explained in detail below:

3.2.1. Practice

The concept of practice refers to the act of doing. Doing daily and in a social context that gives formation and meaning to what is done. Practices are tangible and intangible. What is explicitly explained or defined and those left unsaid: may be represented in the form of documents, tools, structured processes, etc or undefined and left to be discretional (Wenger 1998). In addition, the concept of practice is further explained in the form of meaning, the duality of participation and reification.

First, Wenger (1998) explains that *meaning* is the individual encounter of everyday life and practices. Furthermore, meanings are attained through the process of negotiation of meaning. Negotiation of meanings is progressive, historical, contextual and distinct. The process of negotiation of meaning is impacted by several elements shaping experience but also influenced by those elements. Hence, in the negotiation of meaning, participants experience and learning in a community is been shaped but also shaping group meanings in an ongoing manner.

Second, *participation* refers to the process of been involved in an activity as well as in relations with others. It denotes actions and relational mechanisms. Participation is an ongoing process of both recognizing the knowledge in others and mutually interacting towards creating new meaning. Participating in communities allows the negotiation of meaning which shapes each member's experience and most importantly learning (Wenger 1998).

Third, *reification* connotes the process in which individual experiences are shaped through objectifying meanings. Turning meanings from participation into congeal outcomes that gives room for future negotiation of meanings between members in a community. For example;

creating new techniques, processes, tools or procedures, etc after participation which can be used to solve specific problems at the moment or in the future (Wenger 1998).

Additionally, Wenger (1998) explains that participation and reification cannot take place without the other and described this as the duality of participation and reification in which both are complementary to each other. One cannot be separated or operate on its own. Hence, while individuals participate in the form of relation and actions, new meaning generated is concretized thus inherent in interactions and participation in communities. Additionally, through the interaction of participation and reification: negotiation of meanings shapes who people are. In this interaction, experiences influence each other in a twofold manner that impacts the core of who people are and results in learning and development (Wenger 1998).

3.2.2. Community

Wenger (1998) explained that practice and community are critical components of CoPs. These aspects of the community are developed through mutual engagement a joint enterprise and a shared repertoire.

Mutual engagement: refers to the mutual interactions within groups. Practice does not just take place it does because people are involved and interacting together which is mutually engaging in actions whose outcomes they negotiate to create new meanings which invariably increases both individual and group knowledge. Thus, belonging to a community is about mutual engagement which is what makes up a community. A community is not a group or network of people working or discussing mere issues rather those mutually interacting with each other in the form of collaborative problem solving and knowledge sharing. Wenger(1998) insists that regardless of location and how members may be geographically dispersed as long as they are engaging with each other, a community is existing in such cases. They may be referred to as virtual communities of practice who are not limited by the absence of physical contact.

Joint enterprise: the second characteristics of practice as part of a community existence is that it develops a joint enterprise. This joint enterprise comes from a common interest amongst members in a workplace which could be to accomplish a project or deliver unique outputs which are regarded as a shared pursuit. This then creates relations of answerability to each other, however, not static as norms rather expressed as options that can be negotiated towards the interest of the enterprise.

Shared repertoire: the third attribute of practice as a means of community continuity is the establishment of shared repertoire. This is created through participation and working together in groups or teams towards reaching a common interest. They are represented in the form of routines, ways of doing things, shared facilities, actions, ideologies generated or adopted as part of the operations of communities. The shared repertoire depicts specific meanings to members often unique, differs by groups or teams and may not be similar in other parts of the workplace.

3.2.3. Domain

Wenger (2011) further added that CoPs are not an abstract group of friends networking among each other, they are rather a group of people having an identity created by a shared domain of interest. Belonging and participating in CoPs denotes an identification and devotion to the domain. Thus, having a shared knowledge that makes the difference between members and others. Members identify each other by their competence and knowledge that is valuable to group activities. Also, CoPs are tied together by the shared competencies and interests to learn and grow together. Thus, group identity shaping individual identity and vice versa.

In addition, according to Wenger (1998) identity is built through the negotiation of meaning and the experiences encountered by mutual engagement with others most especially within the communities. Lave & Wenger (1991) in the situated learning theory explains this as how newer employees learn from the older and more experienced employees and their identity shaped in relation to the work as well as in form of meaning and experience been shaped. Identity refers to who people are and how people are constantly being shaped by social practices: participation, reification, and negotiation. Furthermore, Wenger (1998) explains this by the duality of identification and negotiation in which one's identity is shaped by group knowledge, but in also that individual knowledge is also shaping group knowledge through continuous negotiations. Moreover, Wenger (1998) emphasized that learning is rather emergent and cannot be explicitly designed to occur as a structured planned happening, or represented and confined in only oral or textual presentations rather that learning is natural and emergent.

Moreover, communities of practices cannot be designed but that their learning evolves naturally and intrinsically also the development of CoPs is emergent and grows out of the learning needs of learners and can be dissolved when such needs are no longer there. Managers may not create communities of practice as in the case of creating teams within the organisation rather managers

may be able to create forums, facilities and connecting people together for such communities to excel and grow.

3.3. Critique on theory of communities of practice

The theory of communities of practice is not without critique which will be acknowledged in this study. Fuller et al (2004) in agreement with the findings of Gee et al (1996) that organisations are been transformed into self-organizing teams with flexibility and flat hierarchical structures. Thus, the question is how to ensure that communities can be controlled without creating a central unit of power and authority which can allow individuals within communities to retain shared interest and goals without necessarily creating an authority to govern in form of a top-down situation and that these authority concerns and plausible inequalities have not been addressed by this theory (Hodkinson & Hodkinson 2004). Also, about what types of working environment may facilitate the formation of communities of practice have not also been addressed by the theory of CoPs (Ibid). However, since this study is only focusing on how employees experience their work context in relation to developing skills and their experience in taking part within communities, the issues of power relations and plausible inequalities will not affect this study but would be relevant for future studies.

4. Methodology

This section presents the rationale behind the chosen methodology, the research design, case selection, interview guide for data collection and data analysis, also ethical considerations and limitations of the methodology.

4.1 Rationale behind chosen methodology

To reach the purpose of this study, a qualitative research method has been designed. This is because the qualitative study is exploratory in nature. The qualitative study gives a thorough explanation of a social phenomenon hence, it enabled the researcher gain an in-depth understanding of how employee's navigate their competence development in the era of advanced technologies. It enabled the researcher to study employee's actions, expressions and feelings as they tell their stories which were transcribed into valuable data and accounts (Wolcott 1994). The qualitative study also allowed the researcher to examine what conditions management provides to facilitate employees competence development and how employees respond in practice (Wolcott 1994). However, this method is not without critics, the limitations will be presented later in this section.

4.2. Research design

To conduct this study it was to necessary to gather rich data. Gathering rich data enabled the researcher get beneath the surface and take accounts of the narratives of the participants.

Furthermore, since this study is explanatory in nature, it was important to conduct open ended interviews. According to Charmaz (2006) qualitative interviews allows open-ended and thorough exploration of a phenomenon in which the participants has quality experience in. Thus, through twenty (20) open-ended semi-structured qualitative interview, the researcher was able to gather rich and substantial data that examines participants perceptions and responds to external pressures when dealing with competence development (Wolcott 1994).

4.3. Case selection

Previous studies have explored the implications of digitalisation within the high-tech sector and found that the sector is facing times of difficulties and challenges especially when it relates to dealing with human resources since it is a knowledge intensive industry (Wolffgram et al 2018).

HR practitioners within the high-techs firm must find ways to enable a better learning environment and culture. Hence, it became of interest to the author to find a case company as described by Yin (2014) to further understand the problem. A case study method was chosen to gain in-depth insights and understanding of the complexity and how employees are navigating competence development in the era of advanced technologies. To gain access to the case company within the industry, the author identified a job-fair which had in attendance different high-tech firms and approached different companies about the topic. Afterwards, access was granted to a specific company. Since data was needed, the objectives of the study were explained in further details, the company expressed their interest and a common ground was reached and data collection possibilities agreed upon. All information regarding the case company is completely anonymous throughout the study, no personal information about the participants are included in the study.

The case company is a large global technology company functioning within automotive engineering. Been in existence for almost 25 years now, they have a history of mergers and acquisitions for the third time. In Sweden, there are approximately 300 employees in which the majority of employees are white-collar engineers. The business model is constantly changing as the main driver of change is digitalisation. Working on cutting-edge technologies in the form of research and development demands been at the forefront of knowledge and technologies. The three main function areas involve software development, research, and development. In these function areas, employees are divided within different customer projects depending on interests and competencies and may be moved to new projects when necessary. Employees need to continuously update their knowledge as described by previous studies as well as to improve dynamic capabilities. Thus, with these considerations, it is important to further investigate how employees are navigating their development and for managers & HR to consider competence development strategies.

4.4. Data Collection

Interviews

In addition, it was important to collect substantial data to reach the objectives of this study. Semi structured interview was adopted to allow the employees give their own accounts. Furthermore, the interviewees were selected based on those employees and managers who have

been at the organisation for at least more than one year and can offer the most information to the research question. The choice of this selection was to ensure consistency in the results as these group might have similar experience tied to specific events of changes within the organisation. See figure (1) below for an overview of research participants.

Respondents codes & positions	Years of working	Gender
Agr1	23 years	Male
Mgr2	3 years	Male
Mgr3	18 years	Male
Mgr4	14 years	Male
Mgr5	5 years	Female
HR1	4 years	Male
Mgr6	20 years	Male
Emp1	$6^{1/2}$ years	Male
Emp2	$1^{1/2}$ years	Male
Emp3	$2^{1/2}$ years	Female
Emp4	4 years	Female
Emp5	5 years	Male
Emp6	2 years	Female
Emp7	5 years	Male
Emp8	18 years	Male
Emp9	$2^{1/2}$ years	Male
Emp10	3 years	Male
Emp11	$2^{1/2}$ years	Male
Emp12	$1^{1/2}$ years	Female
Emp13	$1^{1/2}$ years	Female

Figure1: illustrating overview of research respondents. Agr1 = Agile Manager, Mgr = Managers, Emp = Employees. Years of working represents number of years working at the case company.

The semi structured interviews were with 20 participants: six managers, one HR and thirteen employees. Since the study aimed to gain a holistic perspective first by examining what strategies are adopted by managers, hence managers & HR were included in the study and because the study is centred on how employees are navigating and responding, 13 employees were included in the study. In addition, the snowball sampling method was also applied by asking initial informants to recommend other suitable persons (Sargeant, 2012). The author

contacted participants by sending emails with information about the objectives of the study and ethical values of been anonymous.

The interview guide was written based on the theoretical approach, purpose of the study and research questions. For managers, the interview guide began with general questions before narrowing it down to questions around what strategies they implement towards developing employee's competencies. For employees, interview questions started also general and moved on to questions about how they navigate competence development.

Interviews were conducted between February to March 2019 in a separate and comfortable room area that allowed the respondents freely express their feelings and opinion. The first few minutes set the mood for participants to feel comfortable before moving on to the interview itself which often took between 40 – 60 minutes.

4.5. Data Analysis

The interviews were transcribed verbatim and at the end of each day of interview and in some cases, few days later. Thereafter, all interviews were coded thematically. First, identifying patterns and highlighting key themes. Data were selected according to codes which then were selected into categories, thematic coding. Also, codes were be selected according to similar themes which allowed the author to find and identify key patterns connected to the theories and research question. Similar categories were connected to similar patterns as well (Charmaz 2006). In addition, prior to data collection, specific theories were chosen and intended to be used to analyse data but this choice of theory changed as during data analysis, new themes and patterns were found hence, different theories adopted and utilized. Just as recommended by Charmaz (2006) to remain as close as possible to the data. Thus, data were analysed and interpreted in connection to the theoretical framework and literature review.

4.6. Validity & reliability

Validity is about how suitable and appropriate a study is conducted (Leung 2015). To ensure the validity of this study, the author started by asking the question "how" to allow the author capture the expressions and feelings of the participants which is of interest to reaching the objective. Thus, the choice of research questions adapts well to the research design. The interview guide were also structured in line with the theoretical approach and to ensure that the

study captures employees and managers experience (Leung 2015). Two pilot interviews were conducted to test the aptness of the interview questions and ensure that they could be answered, afterwards, the questions were better written and constructed. Also, the researcher remained objective when conducting the interviews by not interfering as employees and managers gave their perceptions and experiences. Also, the analysis and interpretations of the results are based on theoretical framework and literature review.

Reliability of a study refers to the accuracy of the study procedures and results (Leung 2015). The author insured reliability by conducting the study in the same patterns. All interview questions for managers are consistent and the same questions maintained. The author avoided interruptions. The same process follows through for employees, the same interview questions are used for all employees. This offered all participants equal opportunities to give an account of their experiences. Also, in the selection of participants, the author selects employees and managers who has been at the organisation for at one year in order to allow consistency in the experience of specific events. Meanwhile, the author maintained a trustworthy and transparent conversation with all parties and explained further to participants that did not understand some questions. According to Leung (2015) coding and finding themes must be done in the same consistency. All data from interviews were coded following Wolcott advise and this allowed accuracy towards generating reliable conclusions. Also, since the author had no earlier contact with the organisation in form of internship or work etc, participants respond more freely during interviews.

4.7. Ethical Considerations

Ethical standards are followed by making sure to receive permission, consent from participants before conducting interviews. Before commencing the interviews, ethical considerations are performed, this includes information about consent, voluntary withdrawal and permission to record interviews. The respondents were informed that participation is strictly voluntary and can be withdrawn at any time. Respondents were informed that participation is completely anonymous as no personal data is revealed throughout the study. To transcribe interviews, recordings are named with different codes and saved in a separate folder which only the author has access to. Although the topic may not be regarded as sensitive, the author made sure that all participants felt comfortable to share their experiences.

4.8. Limitation of methodology

The qualitative method has been criticized especially that it is not as robust as only a small sample units are investigated and may not give room for generalization (Leung 2015). However, since the research questions begins with a “how” question, the objectives for this study is reached and the study’s conclusions can be transferred to other similar organisations in the industry. Another limitation may be that all interviews were conducted in English, some of the participant’s first language is Swedish and preferred to have the interviews in Swedish to feel more comfortable. But, since the author was aware of this, interview questions were written in a clear and concise manner and further explanations offered when necessary.

5.0 Results

This section introduces detailed description of empirical findings gathered from in-depth interviews and connected with the research purpose of this study. The section begins with some background information about how management works to facilitate competence development, followed by the practice of personal development planning from employee's perspective and then individual and group practices of navigating development needs. The end of this section presents employee's perception of organisational characteristics that shapes learning. For confidentiality and animosity reasons, all interviewees have been assigned specific codes see (Figure 1). Quotations are presented to further illustrate findings.

5.1. Management & HR practices

From the information shared by the respondents, the business environment is one that is continuously changing as technology is advancing fast and a lot of new techniques coming in. They are driven hard by these advancement in technology, so to remain relevant it is important keep up with the latest knowledge. According to many of the managers, been at the forefront of the actual technology and development related to advanced techniques especially within the industry involves high volume of complex projects which must be managed effectively likewise many stakeholders. The product development cycle is getting shorter and shorter and requires many support around them especially from teams working on finding techniques and tools to provide continuous on-time delivery while keeping the best standards and quality, hence, work designs are formed around various projects with specific team members. The information gathered revealed that the projects have specific deadlines and standard requirements that teams members must follow and attain.

> We have a lot of stakeholders, so very complex projects we are working with and it's a lot of people involved, a lot of own agendas so we have to sort of navigate all these to get the products that we deliver and that it works perfectly every time. Mgr2

In addition, there's an ongoing reorganisation throughout the firm. According to the managers, few years back, the agile ways of working has been implemented partially in certain parts of the company, but now the reorganisation is to integrate it in all parts and ensure that everyone is working in a coherent manner. The reason for this transformation is the increased complexity

of projects and demands from external stakeholders. They need to be agile and flexible in the ways of working in order to "deliver on time but also respond and implement changes in the projects continously" (Mgr2). The agile software development is basically about enabling teams to adapt to changes more quickly while managing their own affairs. It involves continuous integration: constantly releasing small changes in the products and continuous delivery.

This is where we are transforming ourselves from been a traditional waterfall driven development approach and implementing agile frameworks, agile methods in our development work. Amgr1

Team members have been offered by management few training courses and access to an online platform, so that "all employees have the same basic knowledge about agile ways of working and the different roles and tools" (Mgr5). Basically, teaching the employees how to enable these continuous changes and delivery of products and "also working more agile, being able to be more flexible". (Mgr5)

Meanwhile, Managers and HR expressed that they are facing difficulties finding external trainings advanced enough in relation to actual technological development. Also, most of the systems are relatively new and lacks updated training courses that can support them. This brings another level of uncertainity since those training courses can at most, help them at the initial stage but afterwards, teams find ways to learn themselves:

We are working with that company, it is completely a new operating system, no one knows about this, there are no trainings, nothing, its right on the cutting edge and we are working with that, we have to learn ourselves basically...there is alot of learning ourselves internally with the experts internally doing training and helping people understand the platform, the rest of them we develop ourselves. Mgr2

We are so far ahead that it is difficult to find external help that can help us to at least reach to the next level, they can almost all the time at best help us where we are right now. HR1

Regarding how management deal with competence development for employees, respondents revealed that there is an annual personal development planning which is done using a web based system. The practice is set up as a formal goal setting and personal development planning conducted three times yearly. The initial review is to set both goals and development plans for the year and then it's a mid-year review to evaluate the first half of the plan and then the final review where they evaluate the whole year. Managers and employees have a one-to-one talk on employee's goals but also how employees want to develop themselves and what career paths

they will like to follow. Thereafter, personal development needs in form of trainings that corresponds to many employees are organized and offered to all those employees collectively. Development needs that are not shared among several employees are tougher to implement:

If there are a lot of people who will have the same competence development need, it's easier to get that done and rolling instead of when you have different development needs for each person, then it's more tricky to make that happen. Mgr4

The reason behind this is that the company is project based and cross-functional such that employees move between different projects and teams, thus, it is challenging to organize trainings based on each individual's needs as the training that are useful today for current roles within specific projects, might no longer be relevant when or if employees changes role or move to a completely different project, hence, it is financially constraining to attend to each employee's needs. So, within each project, competence gaps are identified, and collective trainings provided. Furthermore, while there are discussions of personal development planning three times a year, the challenge is actually finding the time to ensure that development activities that have been planned and discussed are eventually carried out and that:

It is good when we are sitting and when we are discussing it, but you should not underestimate the time it takes really to keep this together…Mg4

Interviews reveals that manager's approach has been more *reactive* to competence development needs by taking actions when it is necessary. It could be in relation to the introduction of some new tools or technologies, some external standards and requirement for trainings, or when a competence gap is identified at the beginning of projects and lastly, when employees themselves make such demands. Each manager has his/her own style of responding to competence development needs which differs from person to person. But provide support to employees when they make such demands. According to all employees, their managers provide them support whenever they approach them regarding development needs. Hence, it is not observed as a standardized practice by managers and this leaves room for discretional activities and actions for example; some managers may organize hackathons etc.

We do a lot of different activities, it is abit adhoc I will say.. it is spread out across the managers, we tend to do different things differently…Mgr2

However, on a company level, there are E-learning platforms accessible to all employees which contain a large number of courses and that: "you can find 10,000 training courses on Excel, for example" (HR1) which employees can choose and the responsibility lying on the individual to proactively find those courses and take them.

We have this learning system which puts a lot of emphasis on the learner to actually proactively find the training that he wants to do so they have to be a lot more self-dependent and a lot more proactive, we can set up courses that are mandatory for them and then they do it but they need to also understand themselves what they need and find it. Mgr2

Thus, while there are E-learning courses available to all employees, management also provides mandatory courses from time to time to all employees. Yet, during exit interviews, one main complaint has been that there are no opportunities for competence development and when asked if they have accessed and taken courses on the E-learning platforms, the response is often negative.

This is something that always comes up during exit interviews, employees say they lack development opportunities and when I ask them: have you ever logged into the system to find and take courses? they say no… HR1

The comment above was to explain that one of the reasons regarding employee turnover as noticed from exit interviews was the absence of development opportunities. The comment also indicates two diverging perceptions. On one hand, management perceives that they are providing different platforms and opportunities that should be used by employees and on the other end, employees claim they are lacking those.

5.2. The practice of personal development planning from employee's view

According to the participants, the annual personal development planning is a good opportunity to have discussions with managers regarding career paths, goals and most especially development needs. However, the challenge is the lack of follow-up or feedback meetings between the different intervals of the annual planning to ensure that plans made are somewhat executed or accomplished. According to the respondents, they perceive that nothing actually happens afterward. hence, it then feels like it is an opportunity to have rather an obliged meeting and conversation with managers three times a year and even though such discussions take place anyway, intended outcomes are not attained.

I have felt it is an opportunity to have a forced discussion three times a year. but I don't know if you should have those kinds of systems to follow up and to discuss, you should know better, but it is really important that we actually do something afterward and not just talking otherwise it doesn't really matter. Emp2

The comment above indicates that since plans made are not followed up or carried out as discussed, employees regard it as yet another formal activity that needs to be completed and performed, hence, participates in a passive manner since it is only a formality and practice that do not yield intended results. It was indicated from the interviews that time restrictions and workload are some of the main factors that impede the implementation of planned development activities, for the most part, everyone is having so much work to do and no one is actually finding the time to make sure that plans are followed up.

It has been discussions about what I will like to learn but then everyone is having alot to do and no one is prioritizing to go ahead with what has been discussed. Emp7

Furthermore, another challenge about the practice of personal development planning is that goals and competence development needs are often changing during the course of the year. Mainly because in many cases, employees move or are transferred to other projects with a completely different task, goals, and development needs, hence, rendering the previous plans un adaptive and that:

Halfway through the year, you're transferred to another project where your goals and needs might be different. Emp7

The respondents further explained that the planning system does not provide room for adapting needs during the course of the year as needs are constantly changing as a result of the business environment hence, at the end of the year during the final discussion it ends up that goals are evaluated and measured based on needs in a completely different project at the beginning of the year. Thus, it was revealed that most employees engaged with the web-based system: where they make inputs of their personal development plans only three times a year because they are required to do so which is more of a passive approach.

5.3. Content of formal trainings and signs of resistance

Additionally, employees have to on their own find courses during pressing times and have access to E-learning platforms but some courses are offered as mandatory. Some respondents

revealed that they are mainly using the web-based system mostly to take those mandatory courses. Only very few employees are proactively using the E-learning platforms. Hence, most of them indicate signs of resistance to the web-based system by not using it at all or using it mostly when required to do so.

Not often, mostly when I'm told: now you need to take a course. It's not the first place that I would search for information. Emp9

Furthermore, when asked the reasons for these resistance many respondents gave illustrations that were highly connected to the content of training courses for example: that they easily forgot what was taught on such courses or found it way too easy compared to what is needed for the actual work.

But then the courses, you don't remember so much. Emp2

Other respondents gave reasons such as workshops and practical training courses are more relevant and easier to learn from and remember and that "if you do something and the end of the workshop that you have programmed this raspberry pie for example then it feels like you have learnt something that you can transfer to your work" (Emp1). Also, there is difficulty in finding relevant courses since the platforms have many different options and it is tough to actually find the time to identify and know which of the courses would be useful to job roles. Also, some of the training courses are broad and generic and it is tough to connect it back to daily work activities. Thus, in practice, conscious competence development is more at the point of need or when forced out of necessity on the job, most respondents have mentioned having either turned to ask other colleagues for help or searched for it through easier routes like Google other than taking specific formal training courses.

Nevertheless, the interviews show that when it comes to developing soft skills taking external courses is considered as important, especially when it involves developing soft skills such as interpersonal, communication and leadership skills.

So it means I will be managing people in one way or another, but I haven't taken a course in doing that. I think for example, that would be good to have a course. Okay. You will be moving into this role. Here are some courses that you could take to develop your skills as a team leader for example. Emp5

The comment above indicates the expectations that certain leadership courses are offered when moving into leadership positions. Information gathered was that HR is planning to execute leadership training for all employees.

5.4. Onboarding training

Furthermore, the interviews reveal that for new employees or when assigned a new role, lack of training courses to gain an initial overview of work duties, processes and some basic knowledge of the task leads to frustrations and employees narrates that they feel it is more challenging to get started and running.

What I mainly think about is when there are new people coming in, it takes longer for them to know what the job entails to be, it is a longer one way before they are up and running...at least that was my experience. Emp7

The accounts of the interviewees revealed that it was more challenging for them when they were relatively new and had to personally define their roles, it actually took quite sometime to become fully equipped and knowledgable about work expectations. Hence, it is useful to take some courses to develop that entry knowledge. However, respondents revealed that training courses may not completely facilitate onboarding experience without the peer to peer interactions and the opportunities to connect with more experienced persons to discuss and learn from.

Consequently, from conversations with various respondents, their experience of competence development was shaped by practices on different levels. Those different levels are illustrated below:

5.5. Individual practices shaping learning

From respondent's accounts, in navigating development needs, it is mainly important to have the individual traits of depending and leading oneself. From the interviews, the following themes kept reappearing: myself, self, I.

5.5.1. Employees as entrepreneurs and self-leaders a sign of autonomy

All the respondents argued that since responsibility of developing skills lies largely on the employees. They must act as entrepreneurs by depending on their own capabilities, leading

themselves in finding ways of improving their competences. First, identifying what areas they are lacking in and then finding the courses needed before approaching the managers.

Just as mentioned earlier there are different courses to choose from and up to each employee to search for courses that might be relevant to them. According to the respondents, it becomes difficult because it is too many alternatives to choose from. "I'm given too many options so I don't even know what to pursue" (Emp5). Also the lack of time to actually search. So when stuck with a completely new task, they find other ways themselves to reach new knowledge and that:

It's usually if I want to do that, I need to find myself which course to take. So then maybe I don't know where to look for and I don't have time to sit down and search for interesting courses or classes. Emp7.

From the above remark, employees find this stressful since they have to dedicate time to search for relevant courses hence, they would rather find another easy route to navigate. When probed even more on what response and actions are taken in such situations, participants affirmed to having just continued working with the task and making mistakes.

Making mistakes, at least we reproduce the same mistakes again and again…because we don't have the competency, or we can maybe be more effective if we had more competency. Emp9

The above comment shows that employees navigate in such situation by trying out different things and making mistakes, even though they learn from the mistakes, on several cases, the same mistakes are reproduced, since they lack the required knowledge and could not find the time to search for courses on the platforms provided. Further investigation revealed that this results to stress and frustration which then forces them to stop the work and take out time to learn and improve the competency in that specific area in order to continue working on the project. It becomes obliged out of necessity and as a respondent puts it "forced competence development" (Emp5).

There is frustration that comes with that. I'll be kind of frustrated and not able to do my work. I want to now try to get more knowledge, but it is an endless loop, the more I do it, then the less time I have to do with the work, kind of hard to break that circle. Emp5

From the expression above, stopping the work to learn and improve knowledge in that specific area is also perceived as challenging because time is lost and in most cases specific deadlines are set, hence, while pushing oneself to exceed that limitation, it gets even more complex and complicated like an endless loop of not being able to reach intended outcomes, meanwhile,

more difficult to actually break the circle. In addition, the interviews revealed that in certain cases, such situations of endless loops are not possible to resolve by just taking a training course. It is rather that employees have to think, be creative and innovative in finding ways of solving such problems or as an entrepreneur would do: find any way possible to navigate it.

I mean most issues I have is maybe not solvable by going to a training. It's more that I need to find the issue and try to struggle my way through it or around it… So sometimes it's maybe hard to find. Emp9

I mean most issues I have is maybe not solvable by going to a training. It's more that I need to find the issue and try to struggle my way through it or around it… So sometimes it's maybe hard to find. Emp9

The above expression was to further explain the increased complexity. By saying that the issues may not be solved by taking courses meant that employees need other approaches to solve both competency and task needs. Employees narrated that it is important not to undermine the time and effort these take. Further questioning revealed, that in practice, employees in such times, turn to other colleagues to discuss such problems and more importantly try to reach out to more experienced colleagues who might have managed related task in the past to discuss and collaboratively solve the problems but that this is also hard because everyone has a considerable amount of work to do.

5.5.2. Knowledge repository on key individuals

As mentioned before, employees turn to other colleagues to navigate in situations of competency needs, informants argued that there are key persons within the company that have a lot of knowledge either coming from their years of experience of working with different technical tools and techniques, hence, understand work processes better and have ideas of how things can work more efficiently. So making an effort to know those key persons can help one learn significantly about specific areas.

It’s part of everyday work, like you get stuck with something and then you turn to, talk to someone who would have more experience. Emp7

Usually we have the knowledge within the company that you can start with and try to get to know those guys and learn from them. Emp8

From the comment above, an underlying norm is that when one starts a new job, the person needs to make efforts towards knowing those persons who are quite knowledgeable and one

can learn from. But this is also difficult due to the high workload for everyone and the possibility that such persons are not within the same location, easily identified or accessible.

5.5.3. Investigating for knowledge & creating networks towards an informal system

Hence, several of the respondents revealed that when trying to solve complex task or develop themselves in the areas they are working on, they have become investigators acting more like detectors in hunting for those key persons within the company, who are very knowledgeable and can give answers to their questions, so they can "try to get to know those guys and learn from them" (Emp8). The interviews revealed that employees apply different strategies to finding these key persons. First, starting by building a personal network of colleagues that know those key persons, so when stuck, they contact their network who then links them directly to the key persons. Secondly, creating a direct network of those key persons. Also, others affirmed to basically asking around of whom might know the particular aspect or has the competency in specific areas. In the end, it becomes a lengthy and frustrating process of searching, sending emails and been redirected, until someone that will be helpful is found.

During the years that I've worked here, I kind of made that networking part of actually knowing a bit more where people with the specific competency are working, I know I will go to the person or contact them, ask my question and then they will route me to the person that has the answer to what I need, a lot of detective work. Emp5

Who would know something about this, then I ask someone and it's like oh, I think maybe this person and then you go to ask, oh I think it's this person and then you just go a long way until you find an answer. Emp6.

The interviews show that to navigate development needs, while resisting the E-learning platforms, employees are on their own creating these networks of both experienced persons and people with specific competencies whom they can learn from and also share knowledge. They perceive that they are lacking support in connecting with others and identifying others competency in the form of platforms showing an overview of colleague's competences etc. They are acting like detectors since they lack such informal opportunities for knowledge sharing or forums where they can meet and interact with others. Hence, they are on their own creating an informal system to allow easy knowledge sharing and collaborative problem solving which is regarded to be more impactful when developing new skills and knowledge.

In addition, the respondents mentioned that on other occasions, employees are themselves organizing meetings and opportunities to learn and share knowledge with each other in which anyone can join and participate. However, since it is so informal and has no organisation around it, it is not as often as needed and not everyone is aware of such activities.

Those guys have been organizing like a community of practice, like meeting every second week or so where some people present a topic where you can call in and join if you're interested in…but it hasn't been for a while now though. Emp5

5.5.4. Learning through stimulating projects and task

Furthermore, employees have been experiencing learning by been self-dependent and managing challenging tasks. The following themes emerged: self-learning, significant learning, learning by doing. Many of the employees revealed that they have been learning a lot on the job, just by the interactions they are having daily in completing complex tasks: solving issues and finding solutions to problems.

> So, I have been developing a feature for two years, I've learned quite alot around that, so that's kind of what drives me the most when I need to solve the issues myself and find the answers Emp11.

Also, several informants argued that they have been learning just by doing, making the wrong choices and learning from them and that:

> There's the competence development that I do myself by just doing, making incorrect decisions and learning from that hopefully, and like the self-taught part of it, which actually has been quite alot in this project that I am working in now Emp5

5.6. Fluid roles

Meanwhile, respondents argued that some of their roles are very free and it is upto each person to clearly give it the definition they want and manage it. While some participants mentioned that they are quite happy and like that their roles are fluid as it gives room for them to drive themselves and learn new aspects and that "it is part of the fun that I have to find the answers myself" (Emp9). However, several others perceive this to be challenging as they do not fully understand what is expected of them, more so what should be known and learnt to fulfil role demands:

So, I like the way of working here when it's a bit more free, but it's a balance, if you let it to be too free, it can become stressful even for a person. So, like I don't know what is expected from me and from my role, I

know we have a project that we need to get ready by a date, but during the time before that, what is exactly my role like I am a piece of a puzzle that's supposed to make everything come together at the end, and that is a bit unclear. Emp5.

The above remark shows that having less definition regarding roles might be useful in some cases but when it becomes too free-flowing, it is difficult to manage as it creates tensions more so, tensions within groups when one does not understand clearly what is expected of them since each person is like a puzzle to make the whole come together in the end. So in practice, they turn to ask a lot of questions and engage in informal interactions with other colleagues to be able to give their job some sort of definition and direction.

Meanwhile, from manager's perspective, roles are less restricted to allow creativity and learning within the teams. Also, teams can drive and organize their own activities. Hence, teams are more self-organizing and defining their responsibilities. Which is in line with the on-going reorganisation, so teams are self – dependent seeing less coordination to allow flexibility and quickly adapting to changes to meet project requirements.

There is no coordinator on, on the different levels that is coordinating between the teams. They are basically coordinating and self-organizing between themselves. (Mgr4)

Meanwhile, teams and projects are considered by employees as single companies within the company. Projects are like small separate entities that are operating each to its own and that:

The projects are like small islands in the company, as companies in the company so I don't really know so much about how it works...Emp2

5.7. Group practices shaping learning

Furthermore, interviews disclose that group activities also shapes learning. The following themes emerged related to team practices: learning together,working together and virtual collaborations with others outside the business unit. All these shapes how employees navigate and develop new skills. Many of the respondents argued that they have been learning so much from their groups as opposed to formal educations and that:

The most and biggest area that I have developed myself is by working with the people in my group. I've learnt more from working with the people in my group more than the courses or all the courses that I've taken. Emp10

Others revealed that just by taking out the time in the teams to learn together and collaboratively solve such problems is another practice that increases the competency in that area. With more autonomy, they are able to take out time to learn together and that:

Sometimes you get a task that you do not know how to handle, at least you get the time in our group, you can put the time and effort that you require to learn that skill and figure out the issues, but some teams that I have been working with before, everyone had their own area of expertise and this wasn't as common....but now with this new agile mindset that the company has and then it is abit more open and the task and everyone and no area is managed by one person and that increase the self-competency on that level. Emp1. .

Several respondents mentioned that they have been taking advantage of virtual platforms and communicating with team members sitting in other business units in various parts of the world and through these collaborations, learning has been significant:

We have daily development meeting with those in India also there are sites communication with each other and we learn from each other's tasks and function. Emp2

5.7.1. Helping others practice

As revealed from the interviews, asking and receiving help from others is another typical practice that is very important. Freely and continuously asking several questions, there is no such thing as a stupid question, and as a respondent puts it "it's not competitive. It's not about who knows best or who knows more" (Emp10). Its mostly about helping each other attain shared goals. Thus, when stuck with a difficult situation turning to someone else within teams, project or other parts of the organisation and asking for help is a common reaction. Even though it might take time off the other person, most people are open and glad to help. While it may not be easy to find the right person, generally, everyone is open and interested to help or recommend someone else who might have answers.

That's one of the great things here that nobody is not the interested in helping you if you ask them, if you're having troubles in what you do, there's usually somebody that has gone through a similar program..and if you ask people, they're generally very happy to help you even though it takes time out of their regular day. Emp7

It's more about working as a team and if I don't understand anything, there's nothing wrong with saying, I don't understand this. I need help. Somebody will help. Emp10

Even more beneficial is receiving help from other colleagues who have managed similar projects in the past, in which such interaction with them increases the knowledge regarding the task and new ways, ideas, and solutions are generated.

5.8. Flexibility

The interviews reveal that employees perceive that dimensions of the organisational characteristics shapes learning. For example, some employees are quite glad that the company allows flexible career advancement, which is the ability to move between roles, teams, and departments. The possibility to move between different projects and roles is considered by employees as positively influencing their learning as they get to know more about different areas and grow therein. Having a sense of security that there are different options of roles to choose from and freedom of movement creates a positive outlook and shapes learning experience.

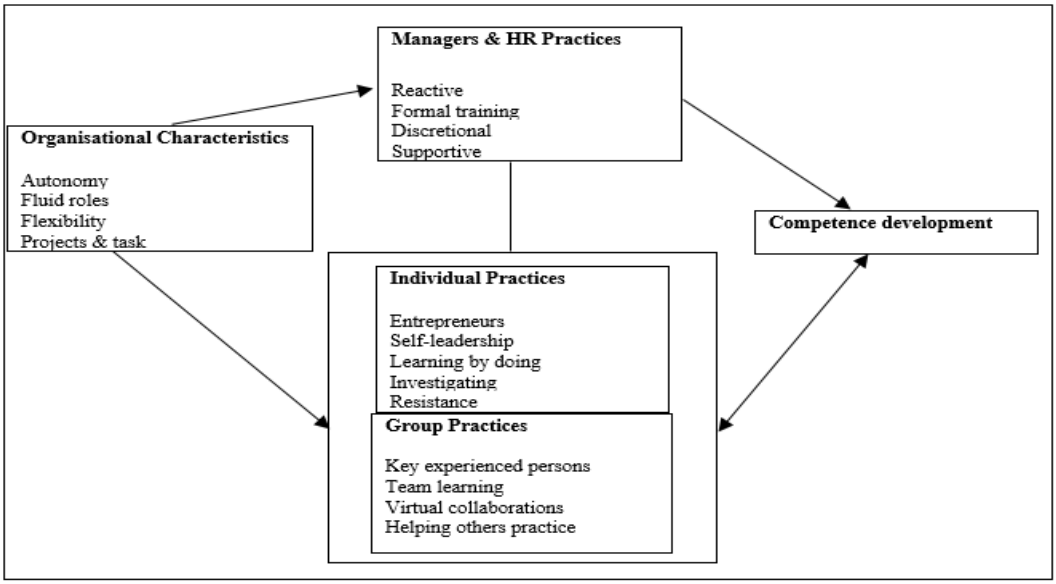
We have had people switching between teams and switching between roles from one department to the other. That is a big thing that the company allow this. Emp1

In the same vein, managers confirmed that the company is quite open with allowing employees to change jobs internally and move between different departments and roles since such flexibility gives the employees possibilities to learn through the task.

It might be someone who wants to change, we are quite open here moving people around between departments we are quite open here moving people around between departments. Mgr2

5.9. Figure 2: Visual overview of qualitative findings

To enable a good overview of the empirical findings, the table below is presented:



The above table illustrates the practices ongoing in relation to competence development as gathered from interviews. First, the organisational characteristics such as autonomy, flexibility, projects, and task, influences how discretional and reactive management practices are when supporting competence development. Also, organisational characteristics is shaping individual practices such as how employees are entrepreneurs, leading themselves, learning through projects, tasks and investigating for knowledge. It is also shaping group practices as it gives the groups room for team learning and engaging in virtual collaborations etc. Second, managers and HR practices directed towards learning include been reactive, discretional which creates space for different activities by employees. They are also creating formal systems and providing support to employees whenever they make specific demands regarding development. Hence, also shaping the practices adopted by individuals and groups. In addition, individual practices directed towards competence development include been entrepreneurs, leading oneself, learning by doing stimulating projects & task and seeking for knowledge through investigation and creating networks towards an informal system. Lastly, it was revealed that group practices such as learning from key experienced persons, learning together in the teams and also engaging in virtual collaborations and mainly helping others practice impacts directly competence development.

6. Discussion

This section will discuss how the different practices as illustrated in the previous section (see Figure 2) are analysed under the prism of earlier research and the theory of situated learning and community of practice introduced formerly in this study. The section begins with a discussion of how management practices are translated as part of a formal system of learning and its impact on employee development. Thereafter, employee and group practices towards an informal system of learning will be discussed in relation to the CoPs scheme: practice, community, and domain, also, team learning and virtual communities. Next, is the interconnection between organisational characteristics and employee development. The last part will discuss the learning environment and employee development.

6.1. Formal system and its impact on employee's development

Our findings show that management practices mainly involve organising a formal system of learning through for example: formal trainings. Previous studies have found that formal trainings do not have a high impact on employee development because training courses were considered as easily forgotten and lacked practical examples (Ha 2008; Spaan et al 2016), this resonates with the findings of this study as formal training implemented at the case company did not have the desired impact on employee development, instead, employees indicated signs of subtle resistance since such training courses were quite generic and not directed to core competency areas, thus, too easy compared to the actual work to be done. In addition, the findings show that the level of complexity increases as there is difficulty finding advanced training courses by managers that meets technical and knowledge demands which are in line with the findings of earlier research that formal training courses today are behind in the actual technological advancements (Budiningsih et al 2017). Other challenges include the inability to transfer such knowledge to work. The empirical material shows that formal structures such as personal development planning remains mainly formal as it is challenging to translate it into practice due to time restrictions, workload and adapting to each employee's needs. Hence, in practice employees are their own leading their learning and navigating by trying to create an informal system of learning (Wenger 2011). Meanwhile, managers tend to organize different activities to address various development needs. It could be when competence gaps are identified at the beginning of projects or when employees make such demands, thus, mostly out

of necessity. Which agrees with the findings of Hjelm (2018) that managers are more reactive in such a changing business environment. Results confirm that managers response to competence development is mostly *reactive* and discretional, not proactively planning or executing events but responding to needs as they arise and providing adequate support to employees on demand. The responsibility lies mostly on employees to on their own drive and navigate development. Managers adopt different styles and perform discretional practices which gives room for diverse actions by employees as opposed to uniformed activities, hence, employees involved in mainly social practices (Wenger 2011). Thus, formal structures are somewhat adapted by other forms of informal actions by employees to facilitate their own development and just as shown by Ellström & Kock (2010) formal structures when adapted by other forms of informal structures influences employee's competence development positively.

Nevertheless, the results of this study show that formal training is regarded as critical especially at the entry level stage of one's career: for new employees and when assigned a new role. Although, highly skilled, employees mentioned that it is useful towards understanding work processes and acquiring some basic knowledge of the job. In the absence of such training, employees experience frustrations and hindered onboarding. Just as argued by Daley (1999) formal training are critical for entry level employees to continuously adapt to work expectations and at an early stage be able to fulfil role demands (Daley 1999). In addition, result reveal that more impactful is when entry level training is accompanied by opportunities for peer interactions with more experienced persons to facilitate onboarding experience, this echoes with what Wenger & Lave (1991) explained that new employees benefit largely from connecting to more experienced persons within the communities.

Additionally, findings reveal that formal training courses, etc, are considered by employees as important towards developing soft skills. The ongoing reorganisation sees an increasing need for soft skills such as leadership skills, interpersonal relations, and social skills in managing both oneself and others. This resonates with the findings of Wolfgramm et al (2018) & HR practitioners that social skills and soft skills are on an increasing demand within the high-tech sector. In addition, other researchers like Renkema 2006; Baert & Kyndt (2013) added that employees require a broader skill set of generic competencies to enable flexibility and adaptability in a constantly changing business environment.

6.2. Informal system in relation to employee's competence development

Throughout the results, employee's narrations depict that learning is very much situated in the work context as it took place through daily work life and most especially through social interactions which are in line with what Lave & Wenger (1991) describes as learning embedded in social context and practices. Employee and group practices are explored below following CoPs scheme: practice, community and domain, also, team learning and virtual communities.

6.2.1. Employees as entrepreneurs a sign of autonomy and room for social *practices*

As mentioned before, results show that employees on their own lead and direct both their jobs and development needs. Attributes such as entrepreneurial spirit and self- leadership were critical when navigating the demands for competence development, this connects and goes in line with the findings of other researchers for example, Bonnici & Cassar (2017) found that employees today develop career adaptability which is a combination of behavioural traits such as self-leadership, self-efficacy, etc to both pursue learning and navigate careers. Also, employees as entrepreneurs resonates with the findings of other researchers that organisations today are characterized more by employee driven human resource development which lays emphasis on the individual to be entrepreneurs in leading and managing their knowledge expansion and roles however, has varying implications for employees (Keursten, 1999: Van der Waals, 2001). In such an increasing autonomous context, findings of this study show that employees have to deal with different consequences such as stress, uncertainty and been in an endless loop of not knowing and lack of time to learn. Also, is the unclarity of what learning opportunities to pursue and work expectations. Therefore, in practice, employees are mainly learning daily and on their own solving challenging tasks. Also, by learning as doing and most of all engaging in mutual interactions with other colleagues thus, learnings embedded in their social context, practices and in what Wenger (1998) referred to as communities of practices.

By owning and leading one's career and development, results reveal that employees have been able to navigate by learning daily from work life and activities for example, when stuck with a complex task that may not be solved by taking a formal training, employees find other ways such as learning on the job in which they experience new *meanings*. In addition, turning to other colleagues to collaboratively solve the task and in the end experience new ideas and ways

of work. This echoes with the practice of *negotiation of meanings* in which employees are shaped by their daily work interactions and also shaping outcomes (Wenger 1998). The ability to share experiences and ideas, new meanings & learnings occur which according to Wenger (1998) invariably increases knowledge. Also, as employees navigate learning through daily work and mutually interacting with others, new ideas and meanings are created, this resonates with what Wenger (1998) refers to as *participation*. Through participation, negotiation of meanings takes place shaping learning. Therefore, employees as entrepreneurs create such room for participating in social *practices.* Results show that new ideas, processes and approaches are realized after such mutual interactions which can be documented and reused for further negotiation of meaning, this indicates the *reification* as described by Wenger (1998) that allows the continuity of ideas and processes after participation and creation of new meanings. Furthermore, Wenger (1998) explains that the duality of *participation and reification* as complementary to each other. Participation cannot take place without reification. Just as shown from the findings of this study that new processes were actualized after collaborative problem solving especially with more experienced colleagues. More so, since groups are self-organizing, they establish their own processes in form of reification and are further renewed to newer processes through the negotiation of meanings (Wenger 1998). However, finding and connecting to those key experienced colleagues in the community to facilitate the creation of new meanings is indicated by employees as involving investigation and searching.

6.2.2. Employees as investigators a sign of identity with a *domain*

Results demonstrate that employees act like investigators and detectors trying to connect with others within the organisations especially those they consider shares common interest and knowledge in specific areas. Therefore, they identify themselves to a domain, just as explained by Wenger (1998). In addition, investigating to connect to key experienced persons within the community who also belong to the domain and just as described by Lave & Wenger (1991) that younger employees can learn from more experienced persons within the communities of practice. The theory of communities of practice adds that domains are characterized by groups of employees sharing competencies that impact each other in a twofold manner and can develop new ideas together through knowledge sharing. Just as revealed by the empirical findings of this study that employees engaged in detective work to enable collaborations with others in the communities whom they identify more by their competence. According to Wenger (1998),

members of the communities see other colleagues more by their competence. Findings show that employees mainly searched for those with the "specific competency" relevant to reaching answers. Thus, by practicing the "detective work" employees identify and negotiate with a domain of practice which also goes in line with what the theory of CoP explains as the duality of identification and negotiability. Results reveal that while employee's identity is continuously shaped by shared group knowledge which occurs through negotiations of experience: participation and reification, they are also shaping the others. Identity, as explained by Wenger (1998), represents who we are and not only self-constructed but shaped by the social context: through daily experience with others. The results of this study show that by participating and mutually interacting with others, new meanings are created and employee's identity shaped. Learning as becoming is reflected by how employees account to experiencing new levels of knowledge after such interactions with others (Wenger 1998). Hence, interactions with other colleagues are considered as the most influential aspect of development especially with more experienced colleagues just as found by other researchers (Collins 2004; Reich et al 2015; Daley 1999). However, the practice of detective work also implies spending time which could be used for more productive work in searching and investigating which sometimes results to frustrations. Additionally another challenge is the lack of such forums for knowledge sharing that could facilitate mutual interactions with others. Also, the lack of platforms to identify other colleague's competences.

6.2.3. Weaving networks towards a *community*

Therefore, results reveal that while investigating to find others within the domain of practice, employees start out by creating networks and connections of who knows "what", "where": the specific location within the same business unit or outside and then "how" which refers to the means towards reaching such persons such as asking around. This resonates to what Wenger (1998) illustrates as the formation of communities. Communities are characterized by a joint enterprise which is not just the shared working environment and conditions rather about joint activities and shared purpose. Just as disclosed by this study that it was not about competing with others but rather reaching the shared goals within groups etc (Wenger 2011).

Findings show that the norm amongst employees is that when one starts a new job or has a new task, the first actions is within the first few years of working invest in building a network. These networks are not just a group of people discussing abstract issues rather a community of practice

involved in *mutual engagement*: knowledge sharing and creative problem solving (Wenger 1998). Results show that the most common reaction when stuck in a difficult situation is mutually engaging with others by asking a lot of questions and seeking help from other employees. Through mutual engagement, findings show that employees turn to other colleagues to clarify fluid roles and work aspects as it is each person's responsibility to do so including giving it some definition on what needs to be attained (Wenger 1998). However, the difficulty is the lack of support towards facilitating such networks of people. Therefore, in practice employees are on their own trying to create these networks, links to establish rather an informal system of learning.

6.2.4. Team learning versus communities of practice

Furthermore, empirical data of this study reveal that teams also play a critical role in learning. According to Wenger (1998) teams are distinct from communities of practice. The differences between teams and communities of practice is that while teams are structurally organized by management and tied together by specific tasks or projects, communities of practice are created informally and happens outside formal structures. Just as revealed by the findings of this study that teams are organized based on task but employees still engaged in CoPs. Communities of practices are mostly tied together by knowledge and defined by the knowledge its members can bring rather than by specific tasks. Members may often belong to different teams and managing varying tasks. The empirical material shows that while employees had their own teams they still engaged in investigating and networking to connect to those others within the communities.

However, this does not mean that learning and knowledge sharing do not take place within teams, just as disclosed by the findings of this study, employees experienced knowledge development just by working in their teams as sometimes they took time to learn together. Since CoP is all about collaborative learning and problem solving, team learning activities are also regarded as social practice of communities. According to Wenger (1998) a domain of practice are members brought together by a specific learning need they share. Results show that team members engaged in learning during moments that it was necessary to stop other activities and learn together. Besides, the nature of social learnings is best understood as emergent. Social practices and learning cannot be *designed*, but rather *emergent* and just as results reveal that learning emerged from relating and collaborating with others within the teams and outside. This also goes very much in line with the findings of Reich et al (2015) on how relational dynamics

influences learning. In a similar manner, Wenger (1998) adds that CoPs cannot be explicitly defined or designed but rather emerges naturally and evolves depending on the learning needs just as revealed in this study that efforts towards CoP were mainly linked to knowledge and learning needs.

Additionally, results also imply that what keeps the activities of both teams and communities of practice ongoing and progressive is the practice of helping each other. It was indicated that asking for help and receiving help were a common reaction amongst colleagues. This echoes to what the theory of CoP referred to as ways of doing in form of *shared repertoire* in which members have a shared way of doing for example: leaving or stopping one's work to take out the time to help other colleagues.

6.2.5. Virtual collaborations as a sign of a virtual community

According to the theory of situated learning**,** communities of practice are not just limited to specific business units or physical environment. They may be spanned across different locations and continue to engage in virtual collaborations and learning using various online platforms (Wenger 1998; Collins 2004). The findings of this study reveal that employees engaged in learning through virtual platforms and affirmed to experiencing new knowledge through such interactions. Virtual collaborations took place among employees sitting in various business units across the world. Wenger (1998) explained that such virtual teams and communities are maintained and realized through a shared domain of interest and value for group competencies towards learning from each other, regardless of limitations for example, distance. In agreement, results show that these virtual communities were enacted through networking and hunting within the organisation regardless of limitations such as time differences and proximity in order to attain new knowledge. Just as added by Wenger (1998) members establish connections among people across organisational and geographical boundaries.

6.3. Organisational characteristics in relation to employee development

Furthermore, results show that different dimensions of the organisation played specific roles towards employees learning and development such as autonomy and flexibility. As earlier mentioned there is no explicit straight way of working at the case company or managing development. Managers have significant freedom in deciding what needs to be prioritized and

how to perform it, in the same vein, employees also have some level of such autonomy, and hence draw from this autonomous context to reaching and navigating knowledge development. Thus, automony gives room for different actions and activities, more as Wenger (1998) explains that practices involve both actions that are clearly stated and those that are left unsaid which gives space for spontaneous actions towards new meanings within the work context. This echoes with the findings of this study that employees were drawing from the undefined context to navigate and create a parallel informal system to meet development needs. Meanwhile, teams are self-organizing and managing their own affairs. This resonates with the findings of Gee el al (1996) that organisations are now transformed to self-managed teams and have autonomous little aspects of the entire body. Furthermore, employees account that teams are more like seperate entities who are operating as companies within the company which implies increasing interactions between teams and problem solving. Hence, our study show that different practices are been developed within the groups and each group/team have their own unique practices which shapes the learning experience of its members for example: taking out time to learn. This also echoes with the findings of Reich et al (2015) that learnings are embedded in "practice of practice" in form of shared meeting etc. Such practices as revealed by the results of this study includes daily meetings within groups and having their own facilities and tools which they share. Teams also have commonly used documents and documentations kept aside for its own activities and reuse and not shared in other parts of the organisation. Wenger (1998) describes these as a practice in community: having ways of doing and concepts which is referred to as *reifications* in practice and *shared repertoire* in form of documents, tools etc.

Additionally, the other dimension is about flexibility. From the empirical data, flexibility is perceived to be how easy it is to quickly join another project or work in a completely new department or area which offers learning opportunities through transfer of knowledge and experience of meaning via encounter with new groups (Wenger 1998). Flexibility may not necessarily be the immediate response in the face of difficult situations. However, been aware of such possibility is translated as indirectly impacting how one perceives development and growth at work. This goes in line with the findings of Ellström (2006) that some dimensions within organisations may be considered to facilitate learning and development. Thus, while the formal structures been established towards learning and development are not exactly working as intended. Employees may draw from other aspects and dimensions of the organisations.

6.4. Learning environment and employee development

This section discusses the work context as a learning environment and in relation to employee development. Previous researchers have argued that opportunities for learning and social practices are tied to how and what ways the working and social context is open and supportive for learning for example, through managers support or other practices (Fuller and Unwin 2004). Just as disclosed from this study, managers are reactive but show interest and support towards questions and demands around competence development. Results indicates that managers often responded in a positive way rather than negative which encouraged the pursuit of different learning tactics. In addition, previous researchers argue that competence development is a key leadership role in which managers may strictly define and recommend learning options (Schuchmann & Seufert 2015). However, results reveal a difference to that because managers played rather a supportive role and applied discretional methods. Ellström & Kock (2010) insists that when the corporate competence development strategy is combined with a facilitating learning environment employee are more at liberate to engage in social practices. Meanwhile, the theory of communities of practice depicts that part of the group/community of practices also includes helping others practice which is the openness and willingness to assist others in form of shared repertoire within the communities. In addition, the critique of the communities of practice emphasized the lack of details regarding what types of organisational environment that communities of practices may be developed in and thrive, as not all work context gives room for the creation or existence of such networks (Hodkinson & Hodkinson 2004). In contribution to that gap, the results of this study show that in some ways a supportive learning environment from managers and some level of freedom are some of the practices that may give room for the creation and practices of communities of practice, hence, that learning highly depends on the context of the organisation (Ibid).

7. Conclusion

This section provides a summary of how the purpose of this study is reached and fulfilled. Additionally, the main contribution of this study is presented, as well as recommendations and suggestions to future researchers.

As mentioned before, the purpose of this study was to examine how white-collar engineers within high tech firms navigate and respond to the demands for competence development under external pressures brought by advanced technologies. To reach that aim, the main research question was subdivided into two sub-questions.

The first sub-question is, in what ways does management provide conditions that facilitate learning and development? To answer that question, this study revealed that the corporate strategy is mainly creating formal systems for attaining learning which include the annual personal development planning system, different E-learning platforms accessible to all employees, offering formal training courses periodically and providing support to employees on demand. In addition, manager's style is reactive and discretional which gives room for different activities depending on what needs arises. The study found that employees did not find these formal systems as highly impactful especially in meeting their development needs related to daily work. Thus, they indicated signs of resistance to the formal systems. However, employees were drawing from other organisational dimensions created by management such as autonomy and flexibility of moving around jobs to navigate and attain new knowledge.

The second sub-question is, what are the practices developed by employees to address development needs? To answer that question, this study found that employees adopted different practices such as having an entrepreneurial spirit and self-leadership towards reaching learning needs and mainly engaging in social practices through participation and reification that shaped their development. Furthermore, employees practiced knowledge seeking by acting as investigators in hunting to find other colleagues within the domain thus, learning through knowledge sharing and interactions with other colleaugues identified as having the knowledge and desired competency. Additionally, another practice involve weaving and creating networks towards a community. Likewise learning new skills through group practices such as team learning and collaborations with key experienced colleagues. Also, through virtual

collaboration which leads to a virtual community. Thus, all these practices indicate the confirmation of a community of practice, which is considered by employees as having the most impact on their development.

Therefore, to answer the main question which is how do highly-skilled workers navigate developing new skills and knowledge in a constantly changing business environment ? our study shows that highly-skilled workers navigate uncertainty by adopting a set of individual and group practices. Individual practices include: self-leadership, entrepreneurship, knowledge seeking and learning by doing. Whereas, group practices include virtual collaboration, team learning, helping others and learning from key experienced persons. All these practices were important because employees are developing their own informal system in parallel to the formal system established by management, which they consider most beneficial to developing new skills. This informal system matches with Wenger (1998) community of practice. However, this informal parallel system has its downside and challenges such as the lack of a clear overview of other colleague's competences and the inability to easily identify other colleagues within the community based on their competency and knowledge. Hence, employees are challenged to constantly search for other colleagues and knowledge within the domain which often involve a long time-consuming process of networking. Also, the lack of such forums and platforms for knowledge sharing represent an additional challenge for employees. Hence, the study revealed the existence of the formal and parallel informal systems in which one is created by the management and the other is created by the employees themselves, yet supported by certain organisational structural changes and practices.

Nevertheless, one can also conclude that formal training still plays a crucial role in human resource development practices. Especially in relation to induction training to facilitate onboarding. Also towards developing soft skills. The study reveals that formal training is considered critical for new employees or those assigned a new position. Also, the study found an increasing demand for soft skills such as leadership, communication, and interpersonal skills which are in relation to organisational transformation and the creation of such network structures or informal systems.

Main contributions

This study provided further empirical evidence to previous research on competence development and theory of situated learning and communities of practice and also found some new aspects as well.

First, through this study and the theoretical approach adopted, the study has been able to gain rather a holistic perspective coming from two different angles, on one hand, what management is doing and on the other the employees. The holistic perspective has unveiled how for example, organisational dimensions like autonomy, flexibility, and supportive learning environment shape employee development because employees were drawing from these aspects to create their own informal system. Thus, this study contributed to the theory of communities of practice on the organisational aspects that facilitate the formation of communities. Also, the theoretical approach adopted has allowed an in-depth analysis of what is happening not only at the individual level but also on the group and organisational level in relation to learning. Thus, the combination of research approach, the theory of situated learning and community of practice has allowed in-depth insights into what is happening throughout the system as experienced by the employees. In addition, the study revealed how employees today are acting more like entrepreneurs leading their development and career. Also, acting as investigators in searching for ways to improve knowledge.

Second, this holistic approach has brought to light the two diverging practices of management and employees in terms of competence development and learning which provides knowledge to both HR practitioners and the field of HRD. This contribution provides evidence to further examine competence development strategies that respond to the actual needs of employees since our study revealed that development opportunities were one of the reasons for employee turnover as indicated in exit interviews.

Finally, the findings of this study add evidence to the importance of the learning environment and reemphasized the interactions occurring within the organisation and how these shapes learning. In a highly autonomous environment with flat hierarchical structures and decoupled practices, the creation of networks to ensure that all the different parts of the organisation are still moving in the same direction and connected becomes essential. The study showed the ongoing creation of such networks and interconnected parts in form of informal system which

might be relevant to be further improved by HR professionals to see how flat hierarchical structures can be continually connected like a network system to facilitate knowledge development, learning and of course productivity.

7.2. Recommendations

The study showed that experienced high-tech employees are to a large extent, on their own trying to navigate the demands for competence development by engaging in and creating communities of practice. This informal learning system has however downsides, as for example employees are challenged to constantly search for other colleagues and knowledge within the domain. One recommendation for HR practitioners & managers is to act as facilitators of this informal system by providing more forums for knowledge sharing as well as helping to nurture the communities. Just as Wenger (1998) argues that leaders can act more like facilitators of the communities of practice but not for their actual creation. This led us to also conclude that it might be relevant to provide more support for virtual communities of practice and teams in both learning and knowledge sharing activities.

Another suggestion is providing online platforms in the form of an organisational chart that will allow employees to see and know other colleague's competencies so it becomes easier to reach out and connect to others in times of need as well as towards collaborations. It may also be interesting to further look into cross-functional team collaboration since the study showed that teams are somewhat like separate entities, it may be relevant to further provide ways to enhance cross-team collaborations.

Lastly, the study revealed that formal training is relevant for new employees and when assigned a new position. Wenger (1998) addresses how entry level training can be structured to be more impactful by explaining that instead of organising training in only reified forms: courses, processes, etc and ignoring the influence of social, to adopt an integrative training method of introducing new employees into learning communities alongside training courses which will allow the exchange of experience between newcomers and experienced persons and not confining learning just to classroom or learning platforms, since such collaborative exchanges may be more relevant than the content of the training

7.3. Suggestions for future research

This study has examined how employees navigate developing new skills in a constantly changing business environment informed by a case study within the high-tech sector. Rich data could also be generated if a similar study is conducted using other methodological approaches and in a different sector or organisational context. Also, this study illustrates the role and relevance of the networks created by communities of practice. Further studies might benefit from looking at the creation of a networked system from a flat hierarchical system with high autonomy and decoupled practices not only for knowledge sharing but also for other organisation. Lastly, further studies exploring internal virtual communities and support towards online learning groups and communities will be interesting as these were aspects revealed by the findings of this study but not the main focus.

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9. Appendix

INTERVIEW GUIDE

MANAGERS & HR

Introduction

Start by introducing myself and give information about the topic, objectives and purpose of the study.

All ethical considerations such as seek consent to record interviews, right to withdrawal and anonymity will be observed. I will also thank the participants for their time.

---- Starts recording

Demographics

1. How long have you been working here?
2. What is your position and responsibility?
3. Can you give an overview of your work here ?

Concept Definition

4. In your own opinion, how would you describe competence development ?

Competence development

5. How do you strategically develop employee competencies to carry out their functions today?
6. How do you work with employee competencies needed for the future ?
7. What external factors influence how you work with competence development for employees ?
8. What are the main drivers for working with competence development ?
9. How does customer needs influence the way you work with competence development ? Can you give examples ?
10. What are the common challenges encountered during such events ?

11. How do employees experience career development plan and strategies? How do they participate ?
12. How has digitalisation been influencing the need for competence development? Can you give examples? Any particular events at the company that has a “before” and after story?
13. How fast are new technologies introduced and how do you cope in such situations? Can you give examples ?
14. How have employees reacted to the adoption of a new technology and the requirements for new competence development?
15. How did you support the employees during the adoption of a new technology?
16. What is the most challenging part of completing task generated by new technologies?
17. How would you describe the collaborations within your team?
18. How are you preparing employees for the future in this times of digitalisation? Upskilling or Reskilling? Give examples

Final Comments

EMPLOYEES

Introduction

Start by introducing myself. All ethical considerations such as seek consent to record our conversation, right to withdrawal and anonymity will be observed. I will also thank the participants for their time.

---- Starts recording

Demographic Questions

1. How long have you been working here ?
2. What is your position and responsibility?
3. How big is your team ?
4. Could you give an overview of your work here ?

Definition of concept

5. What in your own opinion is competence development ?

Competence Development

1. How do you think that your work requires you to develop your skills ?
2. How do you experience competence development here at Aptiv ?
3. What type of competence development opportunities do you know about ?
4. How often do you use them ?
5. How did you know about them?
6. Are there any kind of informal trainings and how has been your experience of this ?
7. How do you think that competence development of any sort has helped you improve your work ? Can you give examples ?
8. How do you experience your manager's support regarding competence development?
9. How do you decide on which development plans to follow ?
10. What factors makes you consider competence development ?
11. How often do you think you learn within your team ? Can you give examples
12. How is the collaboration within your team?

Careers

13. Looking backwards, how has your professional career being like, how would you describe your progression and pathway?
14. Do you currently have any career plans ?
15. What kind of trainings do you think will help you manage this ?
16. How does your manager support you to develop your skills ?
17. How often do you take new courses or undergo new trainings ?
18. Do you experience knowledge sharing ? How do you experience this ?
19. How has digitalization been influencing the need for you to develop your skills ?
20. How fast are new technologies introduced at work? How did you experience this ?
21. Have you ever been in a situation where you didn't know what to do about a particular task ? Can you give examples ?
22. How did you navigate such situation ? Can you give examples ?

Final Comments.