An investigation into the use of Music Notation Software
by both European and Chinese composers

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Abstract

Background – Previous surveys have revealed the musicological analysis of European and Chinese music. A number of viewpoints on MNS informatics have been reviewed from various angles: the role of Music Notation Software (MNS) in compositional process, the interaction of MNS with creativity, composers’ perceptions on MNS packages, and so forth.

Aims – The purpose of this dissertation is to report on relationship between MNS and composers, and to examine the differences between European and Chinese composers who use MNS to assist their work.

Design/methodology/approaches – This research is qualitative and entails the triangulation methods: in-depth interview, participant observation and open-ended questionnaire. The resulting data has been inductively and intuitively analysed to reveal the relationship between MNS and composers. Based on the assumption that the differences exist between European and Chinese composers, a detailed comparison of European and Chinese composers is provided.

Results – The research presents a picture of interaction between MNS and composers. Presentations have been made about different approaches to facilitate compositional process and composers’ attitudes towards MNS packages. Comparisons among European, Western-trained Chinese, and Chinese-trained composers have also been drawn in reference with the above-mentioned issues.

Conclusions - The heterogeneity of the group can be found to reinforce the observation made in the review of previous literature. Tensions between MNS and composers are evidently perceived, mainly with facilities of note editing, playback and the impact on creativity. Each group has revealed the unique nature but to some extent an association with other groups.
**Research limitations/implications** – The limitation correlate with qualitative research based on small sample is acknowledged. However, this research is to explore new research territory and to draw a holistic picture in this subject. Further research will designed to establish generalization based on statistical probability.
Chapter 1 – Introduction

This dissertation is going to investigate the Music Notation Software (MNS) used by both European and Chinese composers, the impact on compositional practices and outcomes, and composers’ evaluations on MNS packages. According to literature analysis and data from face-to-face or online interviews, observations, and online questionnaires, I conclude heterogeneous nature of composers on using MNS, the distress they have encountered, and their main opinions on MNS. Then, I present the differences between European and Chinese composers regarding to the issues I have mentioned above. The conclusion is that composers in both worlds not only have different viewpoint with MNS, as expected, but also, they present their answers in a very different way.

1.1 Background

Music is one of the most important aspects of our lives, whether we are aware of it or not. We are living in a music world all the time, either by listening to CDs, on the radio, television programmes or films. We cannot imagine the world without music. We should keep in mind that there are hundreds of thousands of composers spending their efforts and talents on creating attractive music with high-powered computers and more recently, the advert of vast contemporary audio devices. Techniques have been brought into composers’ studios and homes, and the ability to use computers as an assistance to composition that before, might have gone unheard.

MNS is one of the important members in the composition software family. Alternatively, it is known as a score writer. An MNS allows composers to input, edit, playback, and print music, to varying degrees of sophistication. Nowadays, some more features such as publishing on the internet, file conversion, and producing separate instrument parts are involved in some packages. It is nowadays gradually
replacing pen and manuscript paradigm for its ability to render engraver-standard notation, provide simulated audio playback and produce automatically parts. However, it’s in dispute that, on one hand, technologies, such as MNS, are providing new efficiencies (Peterson and Schubert, 2007), on the other hand, there is much evidence of young composers who are writing digitally illegible and practically impossible music (Byrd, 1994; Dannenberg, 1993). One reason for this is composers’ lack of musical experiences and computer literacy (Watson, 2006). This creates the great issue of how can MNS be designed to meet composers’ requirement to the maximum extent?

People have started taking an interest in how they show their musical ideas with assistance of technology, yet because of music’s multi-faceted nature and the many different types of music, it has not proved to be a fruitful task (Peterson & Schubert, 2007). The music in Europe and China has a lot in common, although some of their branches are massively different (Namminga, 2006). For example, the European music is prevalently presented in Staff Notation System, whereas Numbered Notation System is still broadly served in Chinese music. Also, differences in language, culture context, music history, and technology make it not surprising to assume that MNS is used by composers in different ways. This raises the question, which is addressed in this dissertation that, how does MNS differently impact on European and Chinese composers, in terms of compositional practices and outcomes.

1.2 Motivation

This dissertation was firstly born from my experience relevant to music study. In a decade of piano study by a Chinese pianist who was also a composer, I saw a lot of his working on computer, MIDI keyboard, and printer. I noticed the fact that he was spending a long time on editing notes and repeating audio playback. As a composer he often told me that he would really like to know the notation software in Western counties and how the Western composers produce music in such an efficient way. But
at that moment my teacher was not English literate also there was not a Chinese version of dominant MNS, such as Sibelius\(^1\) or Finale\(^2\). I also noticed that he did quite a lot Chinese traditional music which involves particular notation that the software was unable to represent. This issue was always in my mind during the years I was studying information systems. However, my concern is no longer just the piano performance, but also the music informatics which would be relevant to my piano teacher’s questions 10 years ago. Before this research, I had a talk with a British composer who was working with MNS for almost ten years and he was quite happy with the composing technology in his “toolkit”. Also, he was interested in Chinese music for its beautiful instruments and would like to try producing Chinese pieces. Evidently, these two composers above have opposite attitudes towards the technology with which they are working. The initial informal discussions with this British composer invoked my intuition that composers should be compelled to think more critically about the role of their tools in their working lives. As such, I tend to investigate more phenomenon that exist in both groups.

### 1.3 Aims and Objectives

This dissertation project aims to explore the interaction between music composers and MNS which they are using, and examine whether there are differences between European and Chinese user groups with regard to this issue. Therefore my research questions are:

- To what extent does MNS assist in the compositional practices and outcomes?
- In using MNS to help the compositional process, can tension be perceived to exist between composers and MNS?
- In reference to the above issues, can divergences be perceived to exist between European and Chinese composers?

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\(^1\) [http://www.sibelius.com/home/index_flash.html](http://www.sibelius.com/home/index_flash.html)

\(^2\) [http://www.finalemusic.com](http://www.finalemusic.com)
Through this dissertation I would therefore like to shed light on the compositional methods of composers, to what extent MNS have influenced composer’s practice, and composer’s attitudes towards MNS. Composers are heterogeneous who have different musical understanding, techniques, and ways of working (Eaglestone et al, 2002); therefore these differences might be more significant between European and Chinese users.

The objectives therefore are to:

- Investigate the heterogeneity of composers in terms of the nature of using MNS, compositional processes, and their view on MNS.
- Identify with which form has MNS influenced composers’ practices and outcomes, and indicate users’ opinions and ideas on existing MNS, also highlighting the frustrations they have met.
- Conclude the differences between European and Chinese composers in reference to the above issues.

1.4 Structure

The dissertation therefore endeavours to address the issues as highlighted before. The literature review, presented in Chapter 2, will first of all analyse research about the differences between European and Chinese music, the role of MNS playing in compositional processes, the interaction of MNS and creativity, composers’ perception on the MNS, and approaches to studying MNS. Then, in Chapter 3, I will survey ideas of methodology and the way I conducted interviews, participate observations, and questionnaires. By gathering information from interviews and observations, I found composers have paid more attention on facilities of editing score, playback and subsequently, MNS contributing to creativity. Therefore I will concern more on these three issues in the questionnaire and discuss the frustrations composers have met. These results will be presented in Chapter 4. Then, as one of my research
questions, in Chapter 5, I am going to compare the groups of European and Chinese composers on using MNS regarding to the questions I mentioned before. Finally, the dissertation will thus pull together the results of the literature, interviews, observations and questionnaires with regard to giving a conclusion and recommendation for further research.

1.5 Conclusion

In this introduction I have sketched the background and motivation of this research project, and outlined the aims, objectives and structure of this dissertation. In the following chapter I will review literatures of relevance to this study which will provide a context of this research.
Chapter 2 - Literature review

2.1 Introduction to literature review

The literature review will examine some of the current literature of relevance to my research. It aims to explain the context of my research and set issues that my research project aims to address according to these literatures. Section 2.2 will examine the differences between European and Chinese music and the hybridization of both styles, since my research is ultimately to make differences depending on these two music genres. Section 2.3 will provide a brief overview of MNS and compositional process, from a software development perspective, to explain the role of MNS playing in composition processes. Section 2.4 will focus on the interrelationship between music software and creativity, which is the context to shed light on the relationship between MNS and creativity. Section 2.5 will discuss composers’ evaluation on MNS which provide the initial source of interview and questionnaire. Section 2.6 will review previous research of music informatics to discuss the methodology they employed, to which I referred to design the methodology in my research. Section 2.7 will conclude issues in these literatures that might help to develop the area of current research further.

2.2 European and Chinese music

To people in many cultures, music is inseparably associated with their way of life. This is presented in Namminga’s research: In Europe, music is likely to be an accessory to life whereas Chinese see music as permeating life; hence the Chinese music is more symbolic and conveying deep culture insights and meanings (2006).

In this research, my concern will be restricted to main stream music traditions in Europe and China. Along with the ‘traditional’ tonal thematic music, there are tens of
new-emerging music styles which are important branches of music system. However, I am going to investigate the ‘traditional’ rather than ‘fringe’ music. For example, this study will not in-depth explore notations such as experimental music notations or notation for medieval plain songs.

There are kinds of music all over Europe. The labels such as folk music, popular music, and art music are used to distinguish one kind of music from another. It is hard to define any kind as an isolated island, since both tunes and instruments associated with it can be found in other musical types: classical music, rock, folk, jazz, pop, and Muzak, to name but a few. It is difficult to define and delineate any one of these. As a British folk music scholar said:

“Deep at the root, there is no essential difference between folk music and art music; they are varied blossoms from the same stock, grown to serve a similar purpose, if destined for different tables. Originally they spring from the same area of man’s mind; their divergence is a matter of history, of social and cultural stratification.” (Lloyd 1975:17)

Generally, the most significant characteristic of European music is the harmonic scale. As Beament cited in his book from Helmholtz that the “entire basis of European music was the simple ratios of the frequencies of harmonics” (2003: 30). The harmonics includes the acoustic and instrument aspects. They are significantly represented by choir and orchestra music.

Chinese traditional music could be generally categorized into classical and folk music. The traditional classical music is frequently related to the words such as “thematic”, “poetic”, “philosophic” and is performed by traditional Chinese music instruments, “guqin” and “pipa”, for example. It requires that performers are highly expressive to convey composer’s deep internal emotion. The expression is represented by using sophisticated performing techniques where “synchronized ensemble playing is virtually impossible” (Liu, 2000). The spirit of traditional Chinese music often derives
from poems, from which composers get ideas and inspirations. In addition, language has significantly influenced the development of music. Because of the monosyllabic nature of Chinese language, the monophonic music has subsequently developed as well. Even some traditional Chinese musicians expected that the music in best quality should be the naturally simplest one. This affects the composition situation in Chinese music that few sounds of ethnic instruments could symphonically mix together, but most of European instruments are able to tunefully harmonize all along.

Unlike classical music, Chinese traditional folk music is often vocal that often, the contents are loves or telling a story. Some folk music is played by instrument ensemble, which can be a “silk and bamboo” group which is a kind of traditional Chinese music group, or accompanies with folk dances and regional operas. The folk tradition has significantly influenced the Chinese contemporary music. Some contemporary melodies derive from the existing folk music and modified by conducting contemporary playing techniques or paraphrasing to orchestral music (Liu, 2000).

It is broadly justified that most Chinese music are in the pentatonic scales while European melodies use diatonic scales. However, this statement is not always proper:

“"It is commonly believed that the Chinese write only in the pentatonic scales; this is untrue. Although pentatonic scales were the most common scale-type used, a diatonic scale was also used, and occasionally a septatonic scale was used when a melody was in a descending motion. The Chinese melodies do not use a tempered scale, and the pitches are more improvisational in nature. The melody lines are free form and rarely have harmonic."”(Namminga, 2006)

Besides the differences upon nature of music, the notation system is quite different between the both genres. Western composers use staff notation system which is a set of five horizontal lines to represent different musical pitches. Music symbols are
placed on the staff according to the pitch or function. Whereas Chinese music is often notated by numbered musical notation system, known as “jianpu”, represent the musical pitches by number 1 to 7, and various symbols stand for kinds of articulations and expressions. The complicated written score is from ancient China and has been used for nearly two thousand years. The score below is a simple sample of both staff notation and numbered notation.

![Staff Notation and Numbered Notation](http://www.jianpu.cn/pu/61/61717.htm)

From the early 20th century, Western teaching styles were introduced into music education throughout China, along with other subjects. Quite a lot Chinese traditional music have been rewritten in form of Western notation and the Western notation has gradually replaced the Chinese notation which has dominated Chinese musical presentation for centuries (Namminga, 2006). Despite that, Chinese traditional composers, especially amateurs, are more likely to use numbered notation. This is because of the convention that most Chinese traditional music are still represented by deep-rooted numbered notation system and on the other hand, the Western notation style is sometimes unable to notate special Chinese musical symbols. These marks are relevant to the particular instrumental performing technologies and even written in Chinese character. The two scores below demonstrate the particular symbols in
Chinese music notation. Figure 2 is a sample of “Guqin”, a kind of ancient zither. The notation for it is merely with similar-Chinese characters, similar to Chinese words, including the information of pitch, technique of performance, and finger method.

![Guqin Notation Score](http://pu.guqu.net/guqin/20090805224646_3834.html)

**Figure 2: Notation score of ‘Guqin’**

Figure 3 illustrate the score of “pipa”, a plucked string instrument. The rhythm is noted by numbers, but other symbols and Chinese characters are used to report fingering which is elusive.

![Pipa Notation Score](http://pu.guqu.net/pipa/20090222163942_3557.html)

**Figure 3: Notation score of ‘Pipa’**

Although the difference between European and Chinese music, needless to say, there are forms of hybridization of Western popular music and Chinese music (Namminga, 2006). The compositions by contemporary Chinese composer are mostly westernized. Many Chinese composers fuse parts of traditional music with Western musical stuff, to create a new contemporary genre. In particular, the music being played in orchestras and ensembles have involved more elements of Western music so that they can be more accessible to public.
2.3 Music composition with software

2.3.1 Music software and compositional processes

Over the years, composers and software developers have been devoting to simplify the task of producing music with computer. Generally, software relevant to music is classified into three categories:

‘…algorithms for sound generation, programs that assist the musician in composing with generated sounds and/or the sound of acoustic instruments, and programs that enable the performance of the composition.’ (Dodge and Jerse, 1985: 11)

Composers use computer software for sound synthesis, then they manipulate score editor or composing programs to determine these predefined sounds in terms of producing readable scores. The function of note-making makes MNS as score editor or composing program to some extents. With the score, sound can be produced alternatively by live performance or performance program. Composers could listen to the digital sound vocalized by performance program and make necessary revision according to the sound feedback, then back again. This compositional loop is illustrated as below:
Figure 4: Ways in which composers make use of a computer (Dodge, C., Jerse, T., 1985: 11)

According to the figure, a composition produced with assistance in computer depends heavily on three aspects: computer programs, composers themselves, and the interaction between them. Computer is undoubtedly playing a great role in compositional processes. As to my research, the MNS is a mixture of “score editor” and “performance program” because of its ability to visually generate high-standard music score, and aurally play back the vocal sound. Both of the functions give composers an analogue as real composing or performance. To complete the circular process, sound is given back to composers, which subsequently influenced compositional practices or outcomes, either positively or negatively.
The role of composer should be intimately noticed in composing practices, because without composers’ inspiration or creativity, music would not be emotional or impressive. As Vaggione (2001) claimed, compositional process is a circular process of composer’s action and perception:

‘Action and perception lie at the heart of musical processes, as these musical processes are created by successive operations of concretization having as a tuning tool – as a principle of reality – an action/perception feedback loop.’ (Vaggione, 2001: 61)

To reveal the third aspects of compositional processes- interaction between technologies and composers, Vaggione indicated the “plurality of layers of operations of diverse kinds”. Formal tools (algorithm) could be used as generative and transformative tools but the composition results and choices are controlled and qualified relying on interaction through other compositional instances call for strategies. The use of computer could expand the formal composition categories. This is because the computer are seen not only a “number-crunching” devices, but also an interactive tool which involves composers’ performance (Vaggoine, 2001: 54).

“Composers, especially those using computers, have learned—sometimes painfully—that the formal rigor of a generative function does not guarantee by itself the musical coherence of a result.” (Vaggoine, 2001: 54)

Hence, as Vaggonie stated, composers fulfil their tasks is not relying on an algorithm or a rigid model which refine the composition process. The musical processes, “… are ‘not there’ waiting to be discovered: they are rather to be composed (since they did not exist anywhere before being composed), and hence they cannot be considered properly as modelling activities, even if they use – and deeply absorb – models, knowledge, and tools coming from scientific domains (acoustic and psychoacoustic modelling, for example).”(Vaggonie, 2001: 54).
According to Vaggoine, the composition is a complex network of interactions. The network refers to algorithm and rigid model as well as composers’ perception and performance. Human creativity (music composition in this research) is not hermetic, being influenced by varies of aspects in the context, external or internal. To the external aspects, I am going to investigate that what extent the algorithm is involved in the compositional process and how to influence composers’ perception on their work. On the other hand, to the internal side, I am going to unfold composers understanding and evaluation on these algorithms which assist their tasks.

### 2.3.2 MNS as a secondary orality

Watson (2006) discussed the function of MNS playing in process of composition as part of his PhD thesis. He emphasized on the “simultaneity” nature of MNS. Similar to the Internet, which is a “secondary orality” that allows e-mail or the information on a webpage travels immediately to recipients, just as the voice transmits instantly to a listener. Along with Internet, MNS can be seen as secondary orality as well since composers enter the notes then the playback gives simultaneous feedback.

> “Firstly, the MNS composer writes music via modified literate means, entering notation into MNS’s digital environment. The composer is then aided by the ability to listen to the music while composing, via synthetic or sampled playback. The music exists both as literature and as a modified kind of orality: in exteriorizing music (entering it into MNS) and having another agent (the computer) sound it, the computer becomes as vehicle for “teaching” the composer, both “orally” (aurally) and visually (as notation). Secondly, the playback is available to the composer immediately. There being almost no delay between composition, realization and confirmation.”(Watson, 2006: 96)

As Watson stated, the MNS is a sample of secondary orality which features both aurally and visually representation. Watson also stated the mainly things what an MNS could do: entering notation, playback, exteriorizing real score, and as an agent
between composer and their music. It concretizes Vaggoine’s complex layers network of composition and place a position for MNS in music creative process. I am going to reveal in details that how the MNS acts as a secondary orality as well as what should be done to improve its ability as this role.

Related to the complex layers of composition and the position of MNS in composition, consideration should be given to ways in which MNS, and other composition technologies in a wider sense, offer new possibilities that, composers should critically think over the role of MNS playing in compositional processes, and their reaction to technologies.

2.3.2 MNS packages

In Europe countries, Industry-leading examples of music notation software are Finale and Sibelius. The former was first released for purchase in 1988, the latter in 1993 (Watson, 2006). Both of them are designed base on Western staff notation system while release other versions to many countries with regular software updates. The staff notation way may cause the lack of prevalence in some countries because composers who compose with other notation style, such as numbered musical notation in china, may abandon Sibelius or Finale for the useless notation typeset. Besides, since the unique nature of Chinese instruments, computer performance program may not simulate the voices of these instruments appropriately, because they are not taken into account by Western-designed MNS.

There are a couple of MNS package released especially for Chinese composers, TTComposer\(^3\) and Overture\(^4\), for example. Both of them support Chinese language and provide numbered musical notation, as well as involve Staff notation system

\[^3\] http://www.midisky.com/view/487.html

\[^4\] http://www.qinweb.net/down/software.asp?id=2
which is broadly used in education.

I am not going to evaluate each package and compare their strength or weakness. Commercially, each package has its own consumer group with special preference. I am going to treat all the packages as a concept although they are heterogeneous in nature. On the other hand, composers are also heterogeneous who use MNS in various approaches. Both of the heterogeneity might be more obvious in European and Chinese context respectively. I hope to form a holistic picture of the individual composition methods of each composer, while see different MNS packages as a solid concept.

2.4 Music software and creativity

As a ‘secondary orality’, it is important to assess the impact that MNS has on composer’s creativity, whether or not the use of MNS does in fact save time when compared to writing scores by hand, and the role of MNS plays in compositional and creative process.

A qualitative research was conducted in the University of Sheffield to investigate the relationship between information system and creativity (Eaglestone et al, 2007). Although the sample size is small, as the authors acknowledged in this paper, the purpose of this research was to explore new research territory and try to “identify rich and possibly unanticipated constructs rather than testing hypotheses based on existing theory”(Eaglestone et al, 2007: 443). This research identified that the software, multiple audio applications for example, has to some extent, positively affected composers’ compositional process and support their creative behaviour. Particularly,

“…two aspects seem to have an impact on creativity: the switching between applications and the generation of new and unexpected musical ideas.” (Eaglestone et al, 2007: 452)
Software could accidentally impetus novel sound and ideas. As a composer in this research stated, sometimes when composer was playing with software, a novel sound was created unexpected. In addition, multiple software tools which require frequently switching, including MNS, stimulate creativity by freeing composers from a particular problem. However, another analysis of switching of application claimed that the switching might drive composer from their original problem to another purpose, which is seen as an interruption to creativity. ‘Time away’, which means occasionally leaving away from computer, may lead to creativity. Along with switching among applications, a short break from working on computer would lead to a huge inspiration that contribute great more than a seven-hour composition day.

As a kind of music software, MNS is acting as a member in this family to contribute creativity. Although it is unable to create a fresh sound, it is significant because of its ability to generate serendipitous ideas. Besides, by switching between MNS and other applications, switching among functions which are provided in MNS, or switching among computer programs, hand writing and playing on instruments, creativity could be stimulated, together with occasional interruption such as listening to the playback voice. Therefore, the relationship between MNS and creativity could be viewed as a branch of the previous research. In addition, I am going to concern on the relationship between Chinese MNS and creativity as this problem is largely unreached.

This research also revealed that, similar with reading the speaker’s face and lips has influence on the perception of speech, composers are observed to be influenced by the visual representations of software. Sometimes, composer would rather to edit visually than listen to the compositions. A composer claimed that he could concentrated on the tasks he was doing by masking normal desktop environment and software applications except various sound edition tools and waveform representation of the sound sample. This is because visual stimuli influence the auditory perception of composers. It is clearly that “what we hear is influenced by what we see. Therefore, there are two branches of composers’ behaviour on auditory listening:
“…composers may elect to work from a purely visual representation of sound, or to
disregard visual cues in order to achieve a “pure” listening experience.” (Eaglestone et al.,
2006: 455)

MNS is not only a typical visual tool but also with sonic functions, known as playback. As Eaglestone et al argues, composers prefer to either pure visual representation or pure listening environment. In an MNS, the only pure listening environment is the playback while the pure visual representation is the note-editing interface. It should be challenged that whether there are composers working in both environment simultaneously, that building their work along with listening to the sound or they listen to the sound at the very end. I am going to investigate that to what extent the visual and aural tools are involved in creative processes and influence the outcomes of composition respectively.

2.5 Composer’s perception on MNS

Composers’ perceptions on MN are different, because according to Eaglestone et al (2002), composers are a heterogeneous group who

“….interact with software at different levels; both as users and programmers.” (Eaglestone et al, 2002: 20)

Regarding to composers’ act toward hardware and software, they are loosely classified into three categories:

1. Those for whom software and hardware development and engineering is implicit in the act of Electro-acoustic composition.
2. Those who are more interested in timbral and aesthetic aspects of composition, but engage with software engineering ‘because of “peer pressure”’ (Eaglestone et al., 2002: 21).

3. Those who simply see the software as a means to an ends, and are wholly concerned with the sounds themselves and their timbral and aesthetic qualities.

This classification concerns on electro-acoustic genre rather than the ‘traditional’ tonal thematic music. Accordingly, composers could also be categorized into groups by their behaviour on MNS and the motivation of using MNS. They concerns different aspects of the software and I am going to classify them by the standard of their behaviour towards MNS.

Watson (2006) concluded a couple of aspects which could be used to explain the reason of resistance to MNS. According to his statistic from questionnaire, sizeable composers prefer to work on MNS with the help of piano (or other instruments) or in conjunction with writing by hands. He predicts that more composers would use sole MNS in future, but the revolution will endure a tough transition from pen and manuscript to MNS. The resistance could be from cultural, composition-historical, or composer misuse factors. Firstly, MNS are often be hyped as an all-powerful technology:

“…relieves the composer of all labours unless critical “creative spark”: “All you need is the inspiration to write music. Finale does the rest.”, and fast and efficient: “Sibelius gets it done with more than seconds to spare.”” (Watson, 2006: 102)

In this context, composers may not be able to evaluate their composition and their interaction with MNS. Computer software might distort their work, but they are unable to get any ideas or to adjust. Then, from the historical compositional perspective, a composition should be directly expressed from brain to manuscript. Moreover, some geniuses even work without any music instruments (Watson, 2006:
Finally, Watson stated that a source of the resistance is from users themselves. He cited Mike Katz’s view on this: “it is not simply the technology but the relationship between the technology and its users that determines the impact of [MNS].”(2006: 106) Users’ misuse on MNS could present or even amplify the errors in digital context. Sometimes, mistakes are shown as obvious notational errors or performance-practical errors. However, MNS is not the fault of it, but is composer’s lack of general awareness of theoretical norms or of inadequate training.

As mentioned before at the start of literature review, Europe music and Chinese music differ on kinds of aspects. In this mindset, composers would accept or resistant MNS for different reasons respectively. From the view of composition-historical factor, composers in each world have their own particular composing customs. Therefore the reason of resistance varies from composers to composers. In addition, it is explorable to either demonstrate or challenge the argument in Chinese music genre that senior composers and young MNS users resist the software from different viewpoints.

Watson also stated a couple of influences of MNS upon compositional practices and outcomes. Firstly, with the emergence of MNS, quite a lot young composer never notate by hand, but to start their compositional career on MNS. However, these present-day composers are not aware of that the composition is for rehearsal and performance rather than for software. By contrast, composers who have experienced the shift from pen and manuscript to MNS are perhaps consider cautiously of moving from the first to the second (and possible third) orders of simulacra (Watson, 2006).

“Composers who move from pen and manuscript to MNS, and find themselves interpreting their compositional reality in the second and/or third orders, do so with the benefit of first order hindsight. They maintain the core understanding that instrumental/vocal composition is for performers. By contrast, the composer who begins a career using MNS has not the benefit of hindsight with which to construct an objective view of his or her compositional reality.” (2006:151)
Therefore, young composers are expected to take essential study of orchestration and instrumentation, together with the forging of productive relationships with performers.

However, young composers are more likely to adopt MNS partly because the technological and social conditions. These elements in composers’ formative years encourage the adoption of new technologies. Furthermore, the youngest composers form their knowledge intersecting with mass use of Internet, cellular phones and the iPod. This generation of composer is more likely to adopt MNS (Watson, 2006, 155). However, this situation should be challenge in Chinese traditional music genre. As mentioned before, Chinese traditional music is much more complicated and requires composers to engage more experiences on understanding the substantial spirit of composition. It is worthy to investigate the generation gap upon usage of MNS because contemporary devices may rarely help the adoption of MNS in traditional classification.

### 2.6 Methodology in Music Informatics

Upton (2004) conducted “an investigation into the compositional processes of electro-acoustic composers”. This research examined the working methods of composers, their use of the tools and technologies, and their attitudes towards these tools in the domain of electro-acoustic composition. She interviewed a few of composers and outlined the interview structure beforehand. There are three parts: background information, compositional process and tools and techniques used. Based on the literatures relevant to composition process, Upton related the process into initial stage, development, amalgamation and refinement, compositional form and structure, and organisation. According to the naturalistic interview, although composers have similar background or use analogical technology, four composers revealed their heterogeneity on both compositional process and their work. To name
but a few, someone concerns with timbral qualities of the sound material while others are interested in integral physical properties of sound material. A composer never plans the structure of his composition, whereas a composer uses techniques which are integral to the structure of his composition. However, they have shown their homogeneity to some extent.

“All four composers have difficulty effectively organising their work, and rely on a combination of note-making, labelling sound files, and their memories for organisation.”

(Upton, 2004: 60)

She also questioned composers about frustration towards technology. Overall, composers have positive attitudes towards the tools they were using and frustration could be relieved by growing composition experience.

Upton has taken a qualitative and naturalistic approach to her research. As she did not attempt to define a rigid model of the composition process, rather to develop a holistic picture of the various facets involved in the compositional process, the naturalistic paradigm is therefore suitable for her study.

Unlike the methodology and methods she used, Stone (2005) took a qualitative research which is also an exploratory study. He collected data by interview, review of the literature and questionnaire which triangulated the data. The decision to use triangulation is able to get rid of the problem that “…studies that use only one method are more vulnerable to errors linked to that particular method.”(Stone, 2005: 28) as to his own research methodology, he noticed that

“By forsaking the questionnaire I appreciated the fact that my study became vulnerable to the weaknesses of interview as a method of investigation yet considered this to be the lesser of two evils so to speak.” (Stone, 2005: 28)
He evaluated three kinds of interview. They are informal conversational interview, general interview guide, and standardised open-ended interview. The latter two interview strategies were used in his research because informal conversational interview will be too hard to pull together the data and analyse it. With the initial opinions gathered from interview, Stone carried out a questionnaire to a wider sample because information collected from interview was not appropriate or enough. The questionnaire could reach a good number of respondents from the target group and would extract high quality data. Although the sacrifice of depth and rapport to some extents, they can be achieved in interview.

2.7 Conclusion

As seen from this literature review, the study of interaction between technologies and composers has been fruitful. However, these research were for the most part been confined to Western music context. Both the music software packages are published in use by Western composers and those composers in investigation are all with Western music background. It is perhaps fair to say that the generations from these researches cannot be employed to a wider application. The position of MNS has been covered in previous research by Dodge and Jerse (1985), Vaggione (2001), and Watson (2006). They elaborate the way in which music software and especially MNS take part in compositional processes. They are from software development perspective while the understanding from those researches, Eaglestone et al. (2007), Watson (2006), and Eaglestone et al. (2002), are more likely from users’ perspective. My research hopes to build and expand upon the findings of the above studies and to enrich the understanding of MNS. Especially, with the knowledge of comparison between European music and Chinese music, I am going to explore the different relationship between MNS and composers based on the difference between European and Chinese music.
Chapter 3 - Methodology and Methods of Investigation

3.1 Methodology

This research is intended to be a qualitative dissertation and conducted by triangulation methods. As mentioned in literature review, Upton (2004) took naturalistic and qualitative approaches and she demonstrated that her research was going to reveal a holistic picture on the subject rather than to make generalizations. However, because the naturalistic paradigm is impossible to come to categorical conclusion, and my research is going to explore the differences on using MNS, a qualitative approach could assist to gain common and central meaning through primary data collected from interview, observation and questionnaire.

For the first part of investigation, an exploratory study is undertaken to study the interaction between composers and MNS. This is a “goal free evaluation” (Patton, 2002: 15). This qualitative research consists of three types of data collection which was defined as a triangulation. They are:

- In-depth, open-ended interviews
- Participant observation
- Open-ended questionnaire (Patton, 2002: 7)

These approaches are going to be inductive as most questions are open-ended and observation was carried out in the context of composers’ working space.

The second part of this research is to demonstrate a hypothesis that European composers are acting on MNS divergently from Chinese composers, and vice versa. According to the literature review and the motivation of my research, culture is assumed to be a factor that affects the use of MNS by composers. By analyzing the
data collected in the first stage, I will assess the difference of MNS influencing compositional outcomes in different groups, and their different attitudes towards MNS. Therefore, this research question is fulfilled in a deductive approach depending on an assumption that there are diversity between Chinese composers and European composers regarding to the use of MNS.

3.2 Methods of investigation

The first part of the research is to analyze the academic papers written about MNS and evaluate their usefulness. The content of evaluation includes the methodology they adopted, the academic or practical contribution to my own research, and to reinforce or challenge theories from them. As has already been discussed in the literature review, researchers are more likely to entail the collection of qualitative data from interview, observation and open-ended questionnaires.

The advantages and disadvantages of a couple of MNS are also compared. MNS are often previously evaluated by software users who may be the interviewees I turned to then. When I get a clear picture of the software and academic merits, interview and observation were conducted in order to investigate composers’ evaluation on the software they use. They also introduce other composers who may have knowledge on this subject. After analysis of data collected from interview and observation, a detailed questionnaire was produced to focus on particular questions or further issues developed from interview.

3.2.1 Interview

One of the methods I chose to use to conduct my research is qualitative interview with two small groups of composers. The interviews intend to get holistic impression on how each composer uses MNS to assist in the compositional processes and will reveal their attitudes to their composition and the packages they use. This is with the view of
revealing potential more issues in the research which would be further investigated in the questionnaire.

The interview undertakes in a semi-structured way. It goes by following a main frame designed beforehand, however, in each specific interview, composer develop the conversation in the way with which they feel most comfortable. Therefore, simultaneously adjustment is useful to keep the conversation coherently and causally undertaken (Mason, 1996). The backbone of interview consists of three parts: the demographic data and background data relating to MNS use, the way they use MNS, and their attitudes towards it. The first part includes composer’s education background, the type of composition, the MNS in use and so forth. Then, interviewees describe the way they work with MNS accompanied with present display on MNS. By mixing oral and visual presentation, it would be more obvious and vivid when they explain the composition meanwhile operating the software. Finally, the questions relevant to advantage and disadvantage of the MNS is proposed.

There are four European and two Chinese composers participated in the interview. It should keep in mind that the scenario of conversation is subject to composers’ perception, since the diversity of MNS and the nature of composers. For example, to the questions of playback, some composers claimed that they never use and explained the reason for not adoption. I will not ask their opinions on how the playback has affected their compositional practices.

Although I use the similar set of questions, a number of questions are unintentionally neglected by the interviewee’s answers. During the interview, I have to frequently review the progress because I have to make sure the questions I asked are relevant to the conversation and all the questions I made up beforehand were asked. Many of participants’ answers were leading to further and enlightening issues which warranted investigation in my research or further research.
The interviews were audio recorded and translated into transcripts in full. Chinese interviews are translated into English. The transcript in Appendix A is an example of interview but I am not able to provide all details. It was necessary for me to review the transcript to confirm that I went through all the questions I am interested in and to acquire further information if necessary.

**3.2.2 Observation**

Observation can act as a “scanner” which reduces certain possible problems of interview and questionnaire. Because it is possible that:

- “Your research techniques may have flaws in their design or administration” (Kane, 1985: 55); or
- “People are not telling you the truth, or are deliberately changing their behaviour.” (Kane, 1985: 55); or
- “People may not be able to describe their own behaviour or that of others, for a number of reasons.” (Kane, 1985: 56)

I conducted participant observations with interview, hoping to make interesting observations and draw comparisons between the different ways in which composers work.

The participant observation in my research is indirect observation, which is categorized into “unobtrusive” measures or “non-reactive” techniques to investigate human or their activities (Kane, 1985: 57). It goes with the study of physical traces which does not bias the action of the observed, because “observation occurs after the action has taken place” (Kane, 1985: 57). I observe participants composing when they are at work, record the process of composition and the way they use tools of MNS. Especially, if the participants allow taking video all through the compositional process without intention, naturalistic data would be able to uncover the most veritable
method the composers use. That is because a person’s action can become routine and people do not aware that they are doing them. However, because of the consideration of complexity and feasibility, as well as the privacy of compositions, observations occur only when participants are announced. Some composers showed me examples of his work and methods, which is proved to be effective for me to understand.

Although observations offer naturalistic data, it is problematic because it is impossible to view into the minds of composers, I have to interfere their work and ask questions when ambiguity occurs. This is inadvisable because the observation should be conducted unobtrusive and non-reactive without interference during composers’ work. I prefer to take note during the observation in order to get down the points which will be addressed by participants afterwards.

I found the merging methods of interview and observation was in general successful, since it yielded large amounts of useful data which enlightened further investigations in questionnaire. My questions are not always understood, perhaps due to the false expression or misunderstanding caused by language problem. Composers responded to varying degrees of sophistication. However, I felt I was getting more and more confident in my attempt to communicate in English, and the results are valuable.

### 3.2.3 Questionnaire

Due to the difficulty to communicate enough composers, I proposed an online questionnaire which includes 22 questions. Compare with the interview, questionnaires is circulated to more composers in wider communities. Along with questions propose in interviews, more issues and problems sourced from interview analysis are released with the view to gather further feedback. Therefore, it can be seen as a compensation of interview and observation especially in the environment that Chinese composers are difficult to contact face-to-face because of the geographical distance.
The questionnaire is designed in the similar scheme with interview however with more and in-depth questions derived from interview. There are three sections as well: questions about composer’s background, questions relevant to the MNS they use, and their positive or negative evaluation on the MNS. By taking the interview, I found composers concern more on functions of editing score and playback. Hence, in the second section of questionnaire, I made up a few questions for each function and left a question for them to supplement comments on other functions.

There are two versions of questionnaire, written in Chinese and English. They are posted on two well-established questionnaire websites, “Askform” for Chinese version and “my3q” for English version\(^5\). For different groups, I use different editions of questionnaire. Apart from the language, one in Chinese and the other in English, questions or options are slightly different as well. For example, Chinese composers have more choice on the MNS they use because, for European composers, they are not using packages which are designed particularly for Chinese composers such as Overture and TTComposer. But for Chinese composers, both Chinese homemade MNS and those released for European composers are available for them. Therefore, Chinese composers have more choices regarding to the question: “Which MNS package you use?”

### 3.3 Triangulation

The choice to use interview, observation and questionnaire for research was to triangulate the data collected. This approach can be seen as methodological triangulation, which is one kind of triangulation. I undertake multiple methods; therefore it is between-methods or across-methods triangulation (Bryman, 2006). A

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more integrated study can be conducted by combining a couple of methods. Patton stated that:

“…studies that use only one method are more vulnerable to errors linked to that particular method” (2002:248)

Therefore, combining dissimilar methods to measure the same question, researchers can achieve the best of each while overcoming their unique deficiencies. (Bryman, 2006: 208)

3.4 Sampling

With the purpose of selecting a good sample, the snowball/chain sampling was used in interview and observation. This is proved to be an approach for “locating information-rich key informants” (Patton, 2002: 237). I asked a couple of people who were working on composition in China. They listed the persons who would be knowledgeable with the subject, and then these informants introduced more. On the other hand, in order to contact European composers, I searched academic staff’s email address from the main page of music department of Sheffield University. There are two professors doing composition with MNS, one of them was able to be interviewed. But both of them introduced me some of their postgraduate students who are likely to participate in my research. After each discussion with interviewee from referral, they would contribute the “snowball” to grow larger.

Some names repeated several times by a number of people, so that sometimes I have to create another clue and start a new snowball. The problem with snowball sampling is that the population might not be represented by the sample (Bryman, 2001: 99). I made an initial contact with a small group of people who were studying music in the University of Sheffield and Dalian Maritime University. Therefore, interview participants are more likely to be students or academic staffs in music department of
university. It is as Bryman suggested:

“The snowball sampling is that it is very unlikely that the sample will be representative of the population, though, as I have just suggested, the very notion of a population may be problematic in some circumstances.” (2001: 99)

I pick convenience sampling as the sample methods for conducting the questionnaire. The advantage of convenience sampling is its accessibility. A couple of composers recommended some music forums (both Chinese\(^6\) and Western\(^7\)) on which I can post my request for help. It can be highly responded because composers often upload their compositions and communicating with their peers so that they frequently browse the discussions and they are glad to help. I also searched some other original music forums by myself and posted an online request of asking for help to complete the questionnaire. It can be more efficient to directly contact the active participants of BBS who often upload their composition on the board. Participants click the link and answer questions, and then I am able to see the answers and gather them in right forms. It was proved that those who act more often on the BBS are more likely to help. Hence, by using the convenience sampling, there is a good response rate. Subjective qualities of the composers in the group, ability, experience, achievement etc, are not

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6 Chinese forums:
Chenqigang BBS:
作曲网原创音乐社区: http://www.zuoqu.net/upload/index.php

7 English Forums:
Composer’s Forum: http://composersforum.ning.com/forum/topics/music-notation-software-and
Young composers:
considered into the selection of participants, because all composers’ opinions were important. As such, the participants in the sample ranged from amateurs who do not have music education background to professional composers who have published tens of compositions in public.

3.5 Ethics of the research

In order to ensure the research is ethically conducted, several measures have been taken.

- The objectives of research were explained beforehand to participants and attached with the questionnaire form.
- Any data collected would remain confidential and would be used anonymously.
- Interviews and observations are recorded under participants’ consent.
- The interview transcripts and questionnaire are used in the dissertation only when participants are allowed to do so.
- The data from questionnaire are anonymous conducted.
Chapter 4 - Results and Analysis:

MNS and compositional practices

4.1 Introduction

In this chapter, I will present and discuss parts of the research result - the relationship between composers and the MNS with which they work. Both the interview and questionnaire are undertaken as following: composers’ demographic and background information relating MNS use, deeper questions about their behaviour on MNS, and their attitudes towards MNS. In addition, Observation compensates the data of the other two methods. Section 4.2 is going to conclude the background of interviewees, by revealing in tables, and briefly describe questionnaire respondents. Section 4.3 will display any possible behaviours and attitudes to prove the heterogeneity of composers, as discussed in literature review. It should be noticed that during the research, I found composers have more comments on facilities of editing, playback and the influences of these facilities on creativity. Therefore, in Section 4.4, I will explain the frustrations which composers encountered. At the end, I am going to conclude the main advantages and disadvantages which part of them might be discussed in other sections, but will help to demonstrate in the next chapter.

4.2 Demographic and background data relating to MNS use

4.2.1 Musical background

I began the interview (Appendix A) and questionnaire (Appendix B) by asking some demographic questions such as the year of compositional experience and the compositional music type. This established a context to understand their compositional approach as well as giving a holistic picture on the background of respondents.

There are four European and two Chinese composers involved in the face-to-face
interviews and another two with Chinese composers were undertaken online since the geographical distance which made the face-to-face talk impractical. In each group, there are three composers, composer A, B, C, attached to academic institute in university or conservatory and one, composer D is working as a freelance who treat music as main income source. Composer A in each group is a very experienced composer who is doing research or teaching tasks and also using MNS for a number of years. Particularly, the Chinese professor gives lectures about Finale while using it for composition. Composers B and C are introduced by their teachers: both Europeans are postgraduate students doing composition, while the Chinese students are doing PhD and postgraduate respectively. They have been specializing in composition for 6-12 years therefore they are less experienced. It should be mentioned that both Chinese students have years of experience studying composition in China and taking further training in Europe. The freelance composer in the European group, European composer D, is an experienced composer who has been working on music for more than 25 years. He is interested in almost all sorts of Western music and is highly qualified in music. In contrast, the Chinese freelance composer is well-educated through self study in Chinese music (both traditional and folk music), and has been composing for around 20 years.

13 European and 8 Chinese respondents completed the questionnaire. They have composing experiences varying from 1 year to more than ten years, as professional composers or music amateurs who compose for their own interests.

As for the music type of their composition, European composers are living on tens of music styles. Some of them are specializing in one type while some are interested in “all sorts” or “everything”.

| “Traditional Western notation for academic and leisure purposes”, “Orchestral, Jazz, big band, electronic, contemporary, media music”, “Contemporary classical, 20th century, experimental”, “Avant garde” …… | Questionnaire respondents |
Similarly, there are kinds of music types produced by Chinese composers, along with some Western music types which are mentioned by Western composers in the questionnaire. Some of the Chinese composers are interested in both genres. In particularly, I found those Chinese composers who manage in both genres have experiences of structured studying in university. In other words, Chinese amateurs have less chance to study Western orchestration on their own. Thus, some of them are more likely to specialize in a particular music type. Indeed, a Chinese interviewee commented that he would find it hard to compose in both music genres.

> “I don’t know how to get into the camp of Western music because I didn’t take a structured study of Western music knowledge, that’s what I want to embellish in my current Chinese music. You know, I can sometimes hear the sound of Chinese instruments in some Western music, and I was thinking how can I borrow ideas from Western music as well.”  

*Chinese composer D*

European composers use the five-line stave convention which is seen as convention in education and industry. It is also broadly used in China. However, as the numbered notation is still the dominant method in Chinese traditional music, composers and performers who are doing the particular ethnic music and traditional instruments have to know “Jianpu” (Numbered notation) and use it. However, for the composers who were musically educated, the years of structured education make them literate in both Chinese and Western music genres. They can read both staff and numbered notation, but usually tend to use one.

> “I can read both staff notation and ‘Jianpu’, but the latter is what I usually use because the Chinese traditional music is represented by it. The method of staff notation is what I got in school, but unless required by university, I will use ‘Jianpu’.”  

*Chinese Composer C*
The table below concludes the demographic and background data of interviewees.

<table>
<thead>
<tr>
<th>Composer</th>
<th>Years of Composing</th>
<th>Occupation</th>
<th>Notation in Use</th>
<th>Type of Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Composer A</td>
<td>35</td>
<td>University academic staff</td>
<td>Staff notation</td>
<td>Concert Music, Chamber Music, Voice</td>
</tr>
<tr>
<td>European Composer B</td>
<td>12</td>
<td>Postgraduate student in composition</td>
<td>Staff notation</td>
<td>String Quartet, Chamber Music, Operatic Songs, Experimental Music</td>
</tr>
<tr>
<td>European Composer C</td>
<td>10</td>
<td>Postgraduate student in composition</td>
<td>Staff notation</td>
<td>“all sorts”</td>
</tr>
<tr>
<td>European Composer D</td>
<td>25</td>
<td>Freelance</td>
<td>Staff notation</td>
<td>Orchestral, Jazz, Big Band, Electronic, Contemporary, Media Music</td>
</tr>
<tr>
<td>Chinese Composer A</td>
<td>30</td>
<td>Conservatory academic staff</td>
<td>Numbered notation; Staff notation*</td>
<td>Experimental Music, Concert Music, Choral, Chinese folk music</td>
</tr>
<tr>
<td>Chinese Composer B</td>
<td>12</td>
<td>PhD student in Composition</td>
<td>Numbered notation; Staff notation*</td>
<td>Chinese folk Music, Choral</td>
</tr>
<tr>
<td>Chinese Composer C</td>
<td>6</td>
<td>Postgraduate student in Composition</td>
<td>Numbered notation*; Staff notation</td>
<td>Choral, Chinese Traditional Music, Film Music</td>
</tr>
<tr>
<td>Chinese Composer D</td>
<td>20</td>
<td>Freelance</td>
<td>Numbered notation</td>
<td>Chinese Music</td>
</tr>
</tbody>
</table>

Table 1: Demographic data of interviewees

* "*" means the notation way is more usually used, but composer have knowledge of the other one.
4.2.2  Software packages in use

In European countries, the industry-leading packages are Sibelius and Finale. All of the European interviewees are using Sibelius while the freelance composer uses Finale at the same time. The Sibelius and Finale monopoly is proved by the questionnaire that, although the sample is not as broad as what is needed in quantitative research, that 3 composers are using Sibelius while 6 chose Finale, and another 2 users are trying a mixture of both packages. Packages outside of the Sibelius-Finale monopoly include some less heard names, such as Jack Jarre’s Music Printer Plus, Harmony Assistant and so forth. In reference to the Sibelius-Finale monopoly, composers adopted these two package partly led by their schools or peers.

| “It is unsurprising to find most Western composers to use Sibelius: it is the notation package of choice in a large proportion of British secondary schools and is de rigueur at all university music department.” | European Composer D |
| “When I was doing my AS-level, maybe 8 years ago, I first use Sibelius, copy 3 or 2, I can’t remember.” | European Composer C |

By contrast, in China, there are kinds of MNS existing but there is not a package which is overwhelming in use. Chinese composers B and C started their studying in Europe a couple of years ago, thus they switched to Sibelius (English version) in the pressure of current environment. Along with the Chinese version of Sibelius and Finale, there are several Chinese designed packages specifically for Chinese composers. To name but a few, there are TTComposer, ComposerMaster, and so forth. However, Finale plays a more important role in academic music education than others.
Because of the lack of English literacy among most Chinese composers, and few Western packages being distributed in Chinese, they have to adopt other Chinese designed MNS. The language was taken into account in the design of homemade software, as well as particular Chinese elements such as numbered notation type and traditional Chinese instruments.

“The first Chinese version of Finale is Finale 2006; then I tried to use it instead of writing by hand. Now I’ve been used to it and I suppose some of my students and colleagues to take it at work. And then they said, oh, we should introduce it to more composers.”

*Chinese Composer A*

“I know Finale from a module given by my supervisor. Then I compose a piece and hand it in as a coursework. Since then, I compose with Finale until I come to UK, and I know my friends are all doing like this.”

*Chinese Composer C*

“…after 2005 or 2006, I could use the Chinese version of Finale. But as a trial of software distribution, I found it was not as fantastic as what others claimed. Firstly, I can’t find out how I can set the form of numbered notation score. Therefore I would have definitely said this program is not the one I need, since I do pieces of Chinese folk music. Then I got the numbered notation plug-in, and set it up although it was not working well in the first few months.”

*Chinese composer A*

“I have tried quite a lot packages in the past 10 years. I found most of the Chinese homemade programs are easy to use. They are also being used by thousands of composer amateurs. The reason for this choice is not only they are cheap, able to be downloaded from websites for free, what they concerned more is they can compose on numbered notation score, that a large amount of Chinese composers can’t read staff notation.”

*Chinese Composer D*

To this way of thinking, although each composer adopts MNS as assistance in composing, the reason of adoption is quite different in each case.

### 4.2.3 Years of using MNS

In general, the range of adoption of MNS in both groups is from less than one year to more than 10 years. It is problematic as a young European composer mentioned that, many fledging composers adopted MNS the same year as they began composing, and
always use it in their work. However, for the same question, I found that Chinese composers start their compositional career after a couple of years experience doing hand written notation. As a young composer said:

“I guess that there are two reasons for not adopting MNS in the first year of my education, although I was curious enough to try any technique devices. One is there was not a prevalent program which was thought to be suitable in education. The other is the teaching pattern, which our teachers were giving lectures with pen on manuscript board, especially the module of Chinese traditional music; it would be really tough for a beginner to find out a good package, and search those complicated notes, leaving them at the right place.”  

Chinese Composer B

Handwritten notation experience has been recommended by some experienced composers who have benefited from it a great deal. Both Composers A and D in each group have spent more than 10 years using MNS which has taken nearly half of their compositional life. Before they imported MNS, the traditional way of writing by pen or pencil on manuscript paper was in conjunction with the music instruments in which they were specializing. They all appreciated the experiences of the traditional composition approach and that, perhaps, has shaped the way they use the technology, being more experienced and they seem to use the software more extensively than fledging composers.

“...”  

Chinese composer A

The experience of a live performance is also mentioned as a significant tool, because it gives composers experience like they play music as performers. Composers would feel directly what players can actually do and what they cannot do on the instruments; also, more practical aspects, like how much time the player needs to turn the pages, and so on. However, a computer will not consider these musical issues, or some more practical actions such as physical actions on the instruments. One orchestral composer thought of the work of MNS in a quite different way:
“Some of the problems are not about music, but they are practical. Let’s say, if you look at the tuba, you will find the hand work is very heavy. You have to think about how long will take you to put it down. Without a physical use of the instrument, you can’t make out those things. Also, it needs more time to put them up than put down. You can’t assume that you can do it very quickly.”  

European Composer A

Therefore, he is a member in the camp with the view that young composers should not write on MNS when they first start to compose.

“A colleague of mine in Manchester says that if they (his students) compose on computer, he would cut their hands off...”  

European Composer A

Therefore, it can be seen from Table 1 and the table below that all composers in interviews have been more or less trained before they start using MNS.

<table>
<thead>
<tr>
<th>Composer</th>
<th>MNS in use</th>
<th>Years of Using</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Composer A</td>
<td>Sibelius (English Version)</td>
<td>15</td>
</tr>
<tr>
<td>European Composer B</td>
<td>Sibelius (English Version)</td>
<td>5</td>
</tr>
<tr>
<td>European Composer C</td>
<td>Sibelius (English Version)</td>
<td>8</td>
</tr>
<tr>
<td>European Composer D</td>
<td>Sibelius (English Version) Finale (English Version)</td>
<td>13</td>
</tr>
<tr>
<td>Chinese Composer A</td>
<td>Finale (Chinese Version)</td>
<td>12</td>
</tr>
<tr>
<td>Chinese Composer B</td>
<td>TTComposer Finale (Chinese Version)</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Sibelius (English version)**(^9)</td>
<td></td>
</tr>
<tr>
<td>Chinese Composer C</td>
<td>ComposerMaster Finale (Chinese version)**</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Sibelius (English version)**</td>
<td></td>
</tr>
<tr>
<td>Chinese Composer D</td>
<td>TTComposer Overture</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>ComposerMaster**</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: MNS in use by interviewees

\(^9\) **: This MNS is most often adopted package.
4.3 Heterogeneity of composers on using MNS

The heterogeneity of composers can even be observed within this small sample of composers. Each composer defines their nature and work processes quite uniquely, although they all involve MNS in their compositional practices.

As discussed in literature review, composers are heterogeneous and classified into three groups (Eaglestone et al, 2002). Similarly, I would like to categorize the composers into three classes, depending on their behaviour with MNS.

- Those for whom it is implicit to see the relationship between MNS and composers. It is paradoxical to demonstrate the act of composition with MNS.
- Those who are interested in the functions of packages to help making music, but are less concerning on the software development.
- Those who engage in the newest update of packages and more or less participate in the improvement of software.

The last two groups provide more ideas from the last two groups rather than the first one, answering questions to varying degrees of sophistication. Each composer has significantly shown his/her uniqueness on the nature of using MNS, the compositional process and the change of use during the years of adopting MNS.

4.3.1 Nature of using MNS

Although the compositional process might change from composition to composition, each of the participants have described the basic and fundamental approaches they usually undertake. A sizable response states the preference for working with MNS in conjunction with instruments (such as piano or guitar) or writing by hand.
It should be noticed that MNS allows composers to continue using musical instruments in the digital environment, by way of the MIDI keyboard. On one hand, it keeps the physical feel of the traditional way of composing; on the other hand, inserting notes by MIDI keyboard is fundamentally different from working with pen and manuscripts. Along with clicking by mouse and computer keyboard, MIDI keyboard is one of often-used devices for entering notes. Surprisingly, although I observed that computers are configured with MIDI keyboard in the music lab of the university, neither the interview nor questionnaire provides any evidence of adopting MIDI keyboard.

Many composers conclude their written notation on the MNS because they do fear that their intuition and passion will fade and be replaced by the frustrations on digital devices.

Only a couple of composers distinctively undertake the approach that the MNS is the only technology to assist their works. From the qualitative nature of my research, it should be noted that both of them are young composers. They do not feel any frustration when using MNS without any other technique assistance. One even expected that in a few years’ time, more composers might report MNS as the sole tool as their modus operandi.

“\[quote\]
I wouldn’t compose on MNS, because if you do that, you will get an idea of computer one. You can’t put original work into the computer system; you have to work on what you don’t really want to do.”

\(\textit{Chinese Composer B}\)

“I used to write anything by hand when playing the piano. I prefer playing piano as well as writing a program nowadays, because I’m allowed to hear the real sound.”

\(\textit{Questionnaire Respondent}\)

“I’m used to writing everything by hand, and everything is done carefully... I wouldn’t permit the ink copy until I’m absolutely sure that everything I have written in pencil correct. So I would wait until the whole piece was finished, and then I copy the score.”

\(\textit{European Composer D}\)
It should be kept in mind that composers will, with time and in reaction to the compositional type, alter their strategy of using tools. Despite a composer being accustomed with a fixed working pattern, music type will covertly change, no matter if composers realize it or not. The compositional mode by way of requiring special articulations or expressions can be obviously seen from those composers who do “all sorts” of music.

A Chinese composer is doing music performed by “erhu” (a kind of traditional Chinese instrument) with orchestra backing. This composer writes the solo part by hand, in conjunction with playing “erhu”, representing by numbered notation with particular articulation of this string instrument. Then he composes the orchestra accompaniment just on Sibelius.  

Observation from Chinese composer B

“My compositions often include both Western and Chinese instruments, what I think it are why my music is special. For each part, I have my own way to arrange them because Sibelius now allows me to work them together. The solo is the essential spirit so that I have to make the whole solo piece done and then compose backing sound.” Chinese Composer B

“It depends on the piece. It changes from piece to piece and how I feel that day or if I have access to a computer or paper.” Questionnaire Respondent

4.3.2 Compositional processes

Composers have adequately disclosed the heterogeneity in compositional processes. According to the observations and composers’ descriptions of their own compositional processes, MNS step into the compositional event at different point and they are acting in various ways.

4.3.2.1 pre-MNS stage

In reference to the previous question of the nature of using MNS, those composers only use MNS in their work have proved that their compositional process progressed evidently briefly (Figure 5-(a)):

“I would have an initial idea in my mind, main theme, purpose, and then I start on computer.”

“I did the composing without help of the piano, this is really composing and is more suitable for your purpose.” European Composer C
Composers, who use other technologies, usually start working on composition by doodling on paper or getting ideas when playing piano or both.

| “Improvide, Sketch by hand, Sibelius, playback, refine, relax.” |
| “1) piano 2)hand on manuscript 3) piano/manuscript revisions 4)notation…” |
| “Get Ideas at piano. Write ideas on paper. Expand ideas on MNS. Print music. Music played by musicians.” |

Questionnaire Respondents

As we can see, composers often improvise with instruments or handwritten sketches. However, the initial process of composition is evidently different in each of the four feedbacks before. Apart from whether they involve piano, it differs that some composers circulate their ideas on paper and instrument until they think the score is ready to be copied on MNS (Figure 5 (b)), while some others conclude the handwritten score directly to MNS (Figure 5 (c)). The third respondent in the above textbox has revealed the manual process of revision, which is echoed by European Composer A:

| “I work slowly, and make my own decisions rather than rushing forward. And I tend to not change anything after I compose.” |

European Composer A

By contrast, other approaches to reveal the circular compositional processes emphasis on the loop in which MNS also participate. The initial process of getting ideas is linear that writing on MNS once after sketching by hand. This circular process is proved that the revision cycle is on MNS rather than manually erasing and writing on paper. This tendency is examined in greater detail in section 4.3.2.3.
A questionnaire respondent specifies detailed tasks during hand writing and playing piano. The first step is to “create timeline/form/general ideas for the piece”, which is assumed done on paper. Then, as he figured, “create musical materials through instruments”. Again, the revision tasks of “timeline with musical materials” are taken “at hand”.

Some composers concern on sounds from which to formulate musical ideas at the beginning. They also, when composing electronic pieces, use the timbral qualities of the live instrument as a basis for the composition:
4.3.2.2 Writing on MNS

After the initial ideas for a piece have been established, or the musical material have been prepared for further use, or even the hand-written piece have done, composers would plan their pieces on MNS. This is seemingly a lengthy process although the tasks in this process vary from composers to composers. As the data collected from questionnaire, almost all composers mentioned “writing on MNS” and “playback”. However, by analyzing these data, these actions are playing different roles in their compositional practices.

Notes can be entered via keyboard or by clicking mouse. As observed on Chinese Composer B, he selects the right notes or symbols and places them at the right place. It is the common way which is also used by other composers. However, this approach is seemed time-consuming and bothersome.

““I usually draft the score paper with playing on piano. Then I sequence with DAW, which is a digital performer, until I feel happy with the sound. And then I convert them into MIDI. Because I use both Finale and Sibelius, I reconstruct my piece in either of them…””

European Composer D

““This method is not as quick as I hoped, indeed, it is sometimes annoying when you are typing a complicated score.””

Chinese Composer D

““I don’t have a piano keyboard, and I always use keyboard and mouse to input notes. And I’m happy with that. I use as many shortcuts as I can. The very first time I’ve got the program, I found the best way to learn it was to put a piece of work on it. And I did a lot of work in the first week: I never really recovered from that because I did a lot of mouse clicking. I’d never done it before and my finger started tingle, that’s something I don’t like. And my right hand feels different from my left because my left hand never does that. I don’t like clicking that much. So I tried to not use my mouse unless I need to.””

European Composer B

Similarly, European Composer C, who has been used to keyboard input, indicates that he rarely use mouse unless some certain task cannot be done by keyboard. As observed through the interview, he was able to efficiently entering notes with kinds of
shortcuts and switching between applications. He explained that from the moment he started to compose, he was trying to write on computer and getting more and more familiar with the shortcuts, so that each sign could come out quickly whenever he wants.

Playback is being used in various ways by composers. Some participants said they never use playback or a little if any.

| “I never use playback because it is useless.” | Chinese Composer D |
| “Never, I gave it up as inadequate.” | Questionnaire Respondent |

The data from interviews showed those composers are not satisfied with the playback since its poor sound quality or it threatens imagination. It will be further discussed in 4.4.3.

Other views in this camp contended that the playback is helpful with checking notes or annotations, such as pitch, harmonies, and rhythms, to be released as intended. Composers who play back after the whole composition (see Figure 6 (a)) value the “checking” nature as the most significant reason. Therefore, this facility is seen as a reason to adopt MNS. However, these composers who eschewed playback would not or less influenced by what they hear.

| “…just checking tempos…so the playback is useful to check the wrong notes if you like, but not really informing me what I need to do next.” | European Composer A |
| “I’m more likely to get a clear idea about what I write on the program, so the playback is more a kinds of double check if you like.” | European Composer C |
| “I listen to playbacks only to check whether I did the wrong notes.” | Chinese Composer A |

Of interest was the finding that the data from questionnaire conveys that a lot of composers listen to audio playback after a chunk (Figure 6 (b)). They believe that this

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10 The Dash line stands for some composers would not use playback but directly go to revision.
could make composers more creative by listening to the current passage and imaging what to do next, as in “trial-and-error” composing.

“I’m allowed to judge the form and structure of my works after listening to playback.”

*Chinese Composer B*

There is only one composer indicates in questionnaire feedback that he uses playback even shorter than a measure. This composer has composing experience less than 5 years and about one year experience on MNS. It would be assumed any potential relations between the highly frequency of listening to playback and lacking compositional experience on this fledging composer.

![Diagram](a)

**Figure 6: The stage of writing on MNS**

It should be noted that composers may change their mind when they are on real work. A composer in an interview claimed that he hardly used playbacks and has shown his negative bias. However, as observed when he was composing, he plays back twice: one is after a couple of lines, and the other is after the whole piece. This observation might be explained from two angles: one is that as mentioned in Methodology, respondent may act differently from what they think because some actions cannot be
originally noticed by themselves, yet researchers could observe and recognize the differences with particular attention. Then, It can be more or less explained that composers’ behaviour would change from piece to piece, and is affected by their own feelings.

“Depends on what I need at any given moment of time.” *Questionnaire Respondent*

### 4.3.2.3 Score revision and sharing

It would seem that as a composition begin to take shape, it is necessary for the composers to revise the score, from both musical and typeset consideration. Revisions regarding to musical paradigm often go with playback, as mentioned before, because of the sonic ability to reveal wrong notes.

This benefit is also been appreciated by composers who copy the handwritten score onto MNS. Although they have shaped their minds before writing on MNS, they still play the sound, with the purpose of checking whether the MNS-set score is exactly the same as what they have done on paper.

In contrast to this, composers, who involve MNS in the core compositional process rather than just conclude the piece on MNS, would more likely to change their mind when they review the piece while checking “spelling” mistakes. The comparison can be seen as below:

“I use playbacks even though I can ‘read’ the sound. I concerned that there are not copy mistakes, copy from the hand-written score to the computer, but definitely I wouldn’t change my mind which is led by the playback.” *Chinese Composer A*

“My mind will change after I actually hear the sound, well, like putting more notes, modify the expressions, articulations and so on.” *European Composer B*
However, a number of composers, especially more experienced ones regard the playback as a misleading tool. Apart from the reason of unrealistic sound quality, a composer touched on the interesting issue of the effects of repeating listening:

“If a passage of composed music is listened to repeatedly I may be less likely to modify it since my ear becomes used to it. Audio feedback could impede what I write and modifications are likely to be more mundane.”

*Chinese Composer D*

To this way of thinking, playback cannot help the creative revision; on the contrary, it is demonized because it confuses composers when they are listening. This tendency will be further discussed in 4.4.3.

The sonic function is also mentioned for its ability to save the score as MIDI file and transmit to other users. The key interest on this facility is it enables the communication between composers and players. Some of the respondents said that they burn a real CD as a guide for players to lean the new music. Players would learn from the sonic analogue so that the performance would be more closed to composers’ intention.

“People are learning new pieces and say: Oh, you sent me the part of Sibelius, you must have the sound. Can you send me a MIDI file? Then they start to learn in it from that, rather than from the notes.”

*European Composer A*

Besides, the sound can be recorded into multi-sound tracks that allow players listen to other parts in order to get ideas on their own part.

“I’m working for an electro-acoustic band but I compose music with a real instrument to accompany their parts. Quite often, I burn a CD which plays my part and give it to my friends; they compose and play their electronic parts according to it, vice versa.”

*European Composer B*

By contrast, some composers reject the way of following recorded sound to help real instrument performance. The original musical aesthetic would be destroyed by digital sound and performers would excessively rely on digital analogue rather than playing it from their own understanding which is expected by composers. Therefore,
composers would only share the score rather than along with the sonic presentation.

| "I don’t really want them to play from that. If they do that, they will get digital sound in, and play a digital sound out.” | Chinese Composer D |
| "The real composition is for performers rather than for computer, once performers learn to play a computer way, they wouldn’t know the purpose of the author.” | European Composer B |

4.3.3 Changes of using MNS

A question that “how, if at all, have you changed the MNS package in the time you have used?” is asked both in interview and questionnaire. The purpose of this question is to determine how composers adapted to the introduction of MNS into their work.

Quite a lot composers answered there is no change or not too much if any. They explained two aspects for the steady. One is that the programs were not changing significantly although they were developed with a number of new applications.

| “Not neatly enough. The problem is Finale is the same program it was 15 years ago, just with some ‘stuff’ added in to use newer technology like VSTi. What would be great is new software from scratch.” | European Composer D |

Another reason for the stability is that composers become accustomed to the current package and no longer perceive the perplexities which might have been solved in other packages. Although some frustrations, they would less likely to change because their use of current technology seems so “normal”.

A number of composers reported that they become more expert at using MNS. Not only they are getting more familiar with what the software did and how the program performed operations, but also they have started learning to work around deficits in the software.
A respondent in questionnaire claims that the improved editing and playback facilities enable quicker compositional processes because he requires less time and effort to search particular annotation. He also stated “more Sibelius less hand written”, that would be the ultimate and most significant purpose expected by MNS developing companies.

A composer with less experience on using MNS claimed that he has been working on notational issues. It is assumed that every single composer would go through this stage in the early period of using MNS. This is proved by another experienced composer memorizing the first years of his career:

| “Before, I would write a few measures at a time and check with piano, whereas nowadays I write in medium-sized chunks and then listen.” | Chinese Compose C |

The Heterogeneity of Composers can even be observed within this small sample of composers. Each composer defines the nature of using MNS quite uniquely, and the compositional processes are varying from composers to composers as they are undergoing their personal experiences on MNS. However, there are massive homogeneity existing, especially, they have shown their concerns on facilities of editing notes and playback, as well as the subsequent influence on creativity.

### 4.4 Frustrations with MNS

I questioned the composers in interview about any frustrations with which they might have. Almost all Chinese composers mentioned obstructions with facilities of editing notes and playback. In contrast to this, European composers are satisfied with the
facility of editing score, but commented more on playback which they thought should be improved in versions afterwards. Accordingly, I particularly questioned in the questionnaire of composers’ perception on the facility of “Editing score” and “Playback”. Surprisingly, European composers are invoked to show their suggestions to the “Editing” facility which the interviewees have shown their massive satisfactory. Then, as expected, composers from both groups indicated that they hope the programs can be more user-friendly to improve the sound quality.

4.4.1 Editing

Firstly, it should be noticed that interviewees’ ideas would change with the interview as the process went on. For example, when I have completed a couple of interviews, I concluded that composers are likely to hold positive attitudes towards this facility although kinds of frustration composers have been loosely figured out.

|“I’m satisfied with what I’m doing with these notes.” | Chinese Composer C |
|“Neutral” | Questionnaire respondent |
|“I can find usually things in that, but I can show you something it doesn’t take in.” | European Composer C |

European Composer C spelled out some signs which cannot be found in Sibelius. Rather than automatically selecting from toolkit, composers need to draw them by their own hand. For instance, as he illustrated, the so called “feathered beams” as showed in Figure 7, has to be drawn by hands.

![Figure 7: Feathered beams](image)

“…sometimes you want a gradual transition, I taking them up. You have to draw all these lines by yourself and that kind of things moves around, and overlap and stand there, you can tidy them. Well, you can zoom them in, to make sure you can directly move them there, and then it shows up.”

European Composer C
He also pointed out that Sibelius cannot understand irrational time signatures such as $\frac{5}{12}$, and he showed the complexity of engaging “metric modulation feature”.

| “I know there is a metric modulation feature, but it’s too complicated for when this is happening with each new bar.” | European Composer C |

Very often, composers are creative enough to make up their own annotation which is not usually used by others. That is another reason for packages in industry not including the signs for application. As stated by an interviewee:

| “There is hardly a program which could include all the signs in it. For example, the dynamics, generally, three sign of fortis seem enough for most composition, however, there are some experimental composers would prefer to create even five fortis, which isn’t often seen in other compositions.” | Chinese Composer C |

Another interviewee claimed that it is hard to edit the symbols which he had searched in the toolkit on the right place. In addition, a couple of composers said the space between lines is difficult to adjust.

I applied some trial questions in interviews thereafter. Surprisingly, composers may not be aware of these problems unless I asked questions such as “Do you think the space between lines of score is easy to manipulate?” Heuristic questions have, that composers may not spontaneously make up from their memory in a limited time, provoked interviewee’s idea on this issue or even lead to some more opinions. There are more feedbacks on the option “others” than expected regarding to question 13 in the questionnaire.

| “Others, miscellaneous issues (i.e. cautionary accidentals, system breaks b/w mvts...)”  
“Others, difficult to notate just about anything that is remotely ‘out there’”  
“Others, ease of use, fix bugs” | Questionnaire Respondents |

Therefore, both the interview and questionnaire revealed that packages should be done more to involve more musical signs into the toolkit, as well as the interface is
expected to be designed more accessible so that composers would be able to use the programs more efficiently. However, some of the problems are not due to the technology defects, as a composer mentioned earlier in the interview, but the frustration is closely associated with the experiences on using MNS.

4.4.2 Playbacks

Respondents in both interview and questionnaire have shown their negative attitudes towards the sound quality. Those composers answering the sound quality is important for them commented that they are expecting the sound could be more realistic.

<table>
<thead>
<tr>
<th>“It’s very important but every notation program out there sucks with playback, so I don’t use it. I use it to print parts only.”</th>
<th>Questionnaire Respondent</th>
</tr>
</thead>
</table>

Therefore, composers are unsatisfied with the largely poor quality of MNS playback, and they prefer to work with the sound of real instruments. Although some composers still listen to the sound to make a decision, they never trust the playback and keep in mind that the sound is definitely different when playing by real people with real instruments.

| “It doesn’t impact my compositional processes, because I know playback is mostly false compared to real life performance. It is only a tool to use when I need to hear what the piece is generally doing.” | Chinese Composer A |
| “You have to be aware that the instrument don’t really sound like that. They sound better than that.” | European Composer A |

Therefore, an outstanding composition should rely on composers’ imagination and intuition all the time rather than the pure technology.
4.4.3 MNS and creativity

Assuming a work was intended for actual human performance rather than the program, a playback-devoted composer would need to decide at what extent of polish the computer satisfied his or her creative needs.

Several interviewees and questionnaire respondents acknowledged MNS’s score-setting function as its primary role rather than the creative potential. Although some of them said MNS provide them greater opportunities for compositional exploration because of the dually work with notation and sound which is advantageous, the overwhelming majority regards MNS as a sole score setting tool. Some of them even claimed that the creativity is obstacle by MNS.

“‘In compositions where I have relied more heavily on TTcomposer, I have found that my attention is going to a deeper detail, like focus on finding ‘right note’ or ‘right chord’. However, working solely on manuscript allows me to concentrate on the ‘bigger gesture’, and I could track my progress through the piece.’”  

Chinese Composer D

It can be seen that primarily, the MNS is not a creative tool because it did little or nothing to aid the creative process. As these composers argued, MNS removed the musical imagination that should go throughout the composition, and have hindered creative potentials. In comparison, the inadequate and inaccurate MNS playback which rendered a potential creativity-aiding feature is seemingly impotent.

A few interesting alternative points were raised: although the “undo” function provides certain ability for composers to track the compositional progress, but the whole compositional journey cannot be revealed on the clear interface because the memory has been consigned into a deleted digital data.
The limitation of untraceable compositional progress is also noticed by other actors relevant to music composition. The listening public often like to know the motivation and processes of composers as such knowledge contributing to listening experience; the composing amateurs seek to explore the composing processes in order to improve their own compositional skills; the musicologists need to document their workings on basis of knowing their work. Composers are assumed to do extra work besides the core composition, such as recording the compositional trace either hand written or by using other kinds of software, in order to satisfy the needs from actors as mentioned above.

As with the MIDI keyboard, although it is physically beneficial, an experienced composer seems not recommending this approach because it is a danger to imagination:

“Sibelius uses a lot of the small keyboard, but I’d never work with a MIDI keyboard. I know some people do, and if you go to a studio, you’ll find people are working in that way. Obviously it is easier to use a short keyboard and move things around. But I’m worry about people who play over and over music. Because I think the composing is the imagination be allowed to whatever you need to do...there is something very easy to do with the program, and that will give you certain kind of music which is available to just about anybody using the program, but to write your own music it can help less...let your imagination, go mad.”

European Composer A

This composer mentioned, although the keyboard is simulating the real piano, inputting into digital environment differs from handling the real instruments. Besides, the sound quality and compositional methods would subsequently controlled by technology.
4.5 As a whole

At the end of interview and questionnaire, I asked for composers’ viewpoints on whether MNS has positively or negatively affected their work. Obviously, due to the respondents in the sample are composers who are using MNS for assistance in composing, the composers who are strongly resisting MNS are not considered by this research. There are certain portion of composers are neutral onto the question of attitudes towards MNS. By using MNS, their compositional practices and outcomes are largely improved for the more efficient approach; on the other hand, they expressed some shortcomings that software developers should take account in future.

4.5.1 Advantage

When analyzing the questionnaire and interview transcripts I found that the most frequently mentioned advantage is the powerful editing facility and the neatness of score presentation. This is also the primary functionality of MNS as the software developers aim to achieve.

“Ease of editing/changing”
“My handwriting was terrible, so I couldn’t work by hand. I just grew to love working on the computer.”
“It was easier to use and the results were cleaner to look at.”

*Questionnaire Respondents*
As we can see, compared with using MNS, working by hand is seemingly tedious, tiring, and difficult to edit or make significant change, which is not a problem of using MNS. MNS will have fewer errors if the composer spends time to edit, with the dedicated engraving functionalities.

European Composer B conveyed the playback facilities as the main advantage of MNS which was echoed by some questionnaire respondents:

<table>
<thead>
<tr>
<th>“Certainly readiness of editing facility and constant revision through both visual and playback.”</th>
<th>Questionnaire Respondent</th>
</tr>
</thead>
</table>

Both the editing and playback advantages are specially mentioned by orchestral music composers that MNS is able to extract transposed parts quickly for printing. As a composer doing concert music said:

<table>
<thead>
<tr>
<th>“There are no advantages other than it automatically generates parts.”</th>
<th>Questionnaire Respondents</th>
</tr>
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</table>

### 4.5.2 Disadvantage

As mentioned before, composers feel frustrated with MNS which partly because of the disadvantages of programs. The most controversial point is playback. Some composers concluded it as “unmusical because not real listening/instruments, false sense of balance, can limit creative thinking”. Therefore, Chinese Composer D, who is assumed to be a representative Chinese traditional music composer, asserts that the playback has not influenced his approach of compositional processes.

<table>
<thead>
<tr>
<th>“I was hoping that the program was going to have good playback, but it doesn’t. If the playback was better I might use it to compose, but since it doesn’t, I move much faster by hand.”</th>
<th>Chinese Composer D</th>
</tr>
</thead>
</table>

Unlike doodling on manuscript, MNS provides less freedom quickly shorthand for
composers who are generating their ideas. A well-established composition does not always require neat representation throughout the compositional processes but depending on composer’s personal preference, both musical representation and compositional methods. As an experienced composer mentioned:

“You don’t have as much freedom during your work. You have to follow the conventional way, musical annotation, articulation…but they are what I use a lot.” European Composer D

### 4.6 Conclusion

In this chapter I have present the results of my inquiry into the relationship between composers and MNS with which they use. Composers have shown the heterogeneous nature on working methods, compositional processes and changes of working during the years they adopted MNS packages. Then they spelt out the frustrations they have met with MNS packages which mostly located in facilities of note-editing, playback, and the subsequently influences on creativity. However, most of them compose with MNS, holding positive attitudes

In the next chapter, I will compare European and Chinese composers, with the view of making differences on the point of working methods and evaluation to MNS facilities.
Chapter 5 - Results and Data Analysis:

Differences between European and Chinese composers

5.1 Introduction

In this chapter, I will analyze the differences between European and Chinese composers regarding to the issues I discussed in last chapter. As discussed in the literature review, the nature and music style are different from the other, which marked by their unique culture backgrounds. It can be assumed that composers in each camp have common characters which are unique from the other. Firstly, I will divide Chinese composers into two subgroups by the standard of musical education. Section 5.3 will compare MNS’s role in compositional processes among the three groups. Then in Section 5.4, similar with Chapter 4, I will make the differences of composers’ perceptions on facility of edition notes, playback, and the contribution of MNS to creativity.

5.2 Subdivisions of Chinese composer

Because this research is undertaking in the UK, two of Chinese interviewees have undertaken advanced Western-trained compositional studies while their basic musical knowledge were got in China. According to the interviews, I found it is deficient to simply classify composers into European and Chinese groups. It is interesting to find out that these Western-trained Chinese composers’ perceptions and attitudes towards MNS are a mixture of pure European and pure Chinese composers’. They should be seen as the third group because in some certain situations, their behaviour could incline to one side, however to another research issue, they would be characterized into the other group. Therefore, I prefer to categorize the Chinese Composers into Western-trained composer and Chinese-trained ones.
I asked one Chinese composer, who is studying in the UK, to describe the effect of education experience he has got in China and in the UK respectively, in an attempt to get an impression of which musical genre he is more likely to rely on. Interestingly, he would like to define himself as a “half-blooded” composer.

“I’d like to say both of the education I had in China and UK are of the same importance for me. I’ve got the essential ideas in both genres, even though sometimes they conflict, such as some instruments can’t harmonize well, but I’m trying to find the sound belongs to me, that to create new, experimental music for Chinese instruments. Needless to say, the knowledge of experimental music is what I’ve got in the UK.”

Chinese Composer B

He also, after Western trained, more often use staff notation and orchestration than numbered notation because of the Western education scheme and peer pressure.

“I have to switch to staff notation because no one here can understand the numbered notation. If I want to have my pieces published, I have to make changes.”

Chinese Composer B

Despite this, he indicates that he has not dropped the Chinese music. He also, when composing ‘mixed’ pieces, sometimes uses particular articulation/expression to keep the score clear enough to performers.

As mentioned in literature review, in Europe countries, Western composers are more likely to select either Finale or Sibelius, both of which are recognized as being of industry standard.

“I switched to Sibelius after using Finale for many years, but now I’ve switched back. I was hoping that Sibelius was going to have good playback, but it doesn’t. And most people I work with use finale.”

European Composer D

Western-trained Chinese composers underwent a great conversion from Chinese-made packages to Western produced packages because of the circumstantial pressure. They have to quickly get used to a new program, which their Western peers are fairly familiar with during the years of composing.
By contrast, Chinese-trained composers had spent longer time to search the most suitable MNS package for each of them before they were seriously given lectures of MNS.

“\text{What I suggest is that we should have the lectures of using Finale at the moment right after we start compose. If did so, I wouldn’t have to download and set up such packages and gave a lot of trial on them.}” \textit{Chinese Composer C}

Therefore, Chinese native composers have tried more packages than Western ones, although they seriously use MNS comparatively later than them.

I conclude the composers into three categories as below:

<table>
<thead>
<tr>
<th>Composer</th>
<th>Education background</th>
<th>Notation Way</th>
<th>MNS in use</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Composer</td>
<td>Purely Western trained</td>
<td>Staff Notation</td>
<td>Western developed package</td>
</tr>
<tr>
<td>Western-trained Chinese Composer</td>
<td>Trained in both world</td>
<td>More Staff Notation</td>
<td>More Western developed package</td>
</tr>
<tr>
<td>Chinese-trained Chinese composer</td>
<td>Purely Chinese trained</td>
<td>Numbered Notation</td>
<td>More Chinese developed package</td>
</tr>
</tbody>
</table>

Table 3: Subdivision of Composers

5.3 MNS participating in compositional processes

Although the small sample of this research and qualitative methodology it conducts, it can be seen that composers in Europe countries adopt MNS earlier than composers working in China. There is not a standard package used in compositional education, so that composers have to grope for the best program to assist in their work. On the other hand, the hand-writing convention can partly explain the late adoption of MNS.

European and Western-trained Chinese composers in this research have loosely shown their various way of composition: use MNS as sole tool, MNS in conjunction with
handwriting or instruments or both, conclude hand writing on MNS, and so forth. All the participants show their unique characters in each case, whereas Chinese composers are more likely to start their work by writing on paper, making hand-written revision, and back again. Then they will conclude the hand-rendered score onto MNS, and do further revision. Unlike the debate in Europe world that young composers are pursuing their own style which is different from their mentors, Chinese young composers are following the way which is defined as convention, also adopted by the older generations.

| “I’d like to say my working style has changed a lot after studying here. I can remember that the students in China, including me, almost all of us composed fairly similar with our supervisor.” | Chinese Composer C |

### 5.4 Evaluation on MNS

#### 5.4.1 Editing score

Due to the music differences as discussed in Literature Review, Western and Western-trained Chinese composers think highly of the facility to print parts from a score quickly, especially mentioned by orchestral music composers. When I asked the question of “What led you to adopt the use of MNS in your work?” Western trained composers left the “automatically produce part score” as one of the most frequent answers.

| “wrote a chamber orchestra piece, didn’t want to hand write parts and score.”
| “not having to copy parts” | Questionnaire Respondents |

In contrast to this, because the Chinese traditional music is mostly represented in form of solo, or much less parts than the orchestral music if any, it is needless to entail Chinese packages have strong ability to render and print each part. As a Chinese
composer started composing orchestral after he studied in the UK, he found it is much complicated to think over the harmony among each parts, and even more complicated to manually copy parts after he finished the piece.

“After the first time I wrote an orchestral piece, I know I have to use a Western-produced MNS…that it is the last time in my life to copy each parts by hand. It was really annoying…I didn’t see it before when I was in China, because I did traditional instrument music, they are solo, even with only one line, unlike a piano score consisting of two lines for both hands.”

*Chinese Composer B*

Chinese composers, both Western trained and Chinese trained, have spontaneously shown their emphasis on functions of finding the symbols and place them on the right place. When I asked them in the interview: “How do you think the function of edition notes?” they were not hesitating to spell out the tensions they have met with getting signs, putting them on score, and so on. However, when the same questions are asked to European composers, it should go with some instances, such as: “Can you easily find anything you want easily?” or “Do you feel any difficulty when you adjust the space between lines?” Without the question guide, European composers can hardly response as simultaneously as Chinese composers. This situation is also found in observation and questionnaire. There are sizable questionnaires answered by European composers revealing the conflict as below: to the question of “Please evaluate the function of entering notes and musical annotation.” The responses from European participants are more likely to be “strongly satisfied” or “satisfied”. However, in reference to the next question: “Please indicate what should be improved in entering notes or music annotation” they are seemingly unsatisfied with this facility, because they choose the options I have given for selection, sometimes more than one, to indicate their tension with it. In some cases they are motivated to give more ideas, as I mentioned in 4.4.1. Besides, according to observation, I found European composers would not see the frustration of adjusting space between lines as an obstruction, although they were actually spending great effort.

Western-trained composers are probably the very group who has most to say about the
editing facility. One aspect is with the incompatible issue of specific Chinese music annotation and Western developed MNS. Composers should bear in mind that a package is designed on basis of essential requirement, assisting the vast majority of users rather than take every user’s needs in consideration. However, packages are more and more user-friendly by publishing regularly published plug-ins. Despite this, some Western-trained Chinese composers claimed that the Chinese score are more difficult to edit, no matter in staff or numbered notation or writing into Western or Chinese MNS, because Chinese music has more complicated expression or articulation which is have not been perfected in some packages.

5.4.2 Playback

All of the three groups present their unsatisfactory with the sound quality of playback. In comparison, Chinese composers have more negative attitudes towards it because both the hardware and software are immature on simulating the sound of Chinese instruments. Similarly, the sounds of Western string instruments, such as violin, are extremely fuzzy. Therefore, although composers keep in mind that the computer sound is quite different from the real one, and the playback is on purpose of checking wrong notes, composers working on string instruments and Chinese instruments are still away from the playback.

“Playback make the aesthetic loss of violin, also other instruments such as “erhu” or “pipa”, you don’t want go on listening to that. The sound becomes harsh and intolerable.”

Chinese Composer C

As I discussed in chapter 4, composers, occasionally, would burn a CD to performers, to help players learning the music. However, this approach seems eschewed by Chinese traditional musicians, both composers and performers. Chinese traditional music may be very abstract, it requires continual contacts among actors involve the composition, not only regarding to the spirit of music, but also, the playing techniques to render the spirit. In contrast to this, Western instrument performance needs less on
personal communication between author and player. Therefore, Chinese composers would do more in face-to-face conversation rather than simply post them a CD sound sample. Sometimes, the performers of Chinese traditional music are the authors themselves, since the composer know their own work the most.

“One of my colleagues is a composer also a player doing “Guzheng” (Chinese string instrument, with 21 metal strings, pentatonic scale). He plays his own pieces after the composition is done, because it is no need to spend long time on negotiating with anyone else. Once time he told me that he could easily create the sound of horse’s hooves rather than a cascading waterfall, but for other player, he has to tell them the sound he want and how to play like that.”

*Chinese Composer D*

### 5.4.3 Contribution to creativity

As I mentioned before, Chinese composers concern more on the edition facility of MNS more than European ones, although both of them have found the frustration when editing the score. It would be assumed that Chinese-trained composers require more from the MNS as a score setting tool. In other words, Chinese composer are less likely to treat MNS as a creativity tool.

“I don’t think Chinese will regard the computer as a method of creativity. Their ideas are from their thinking; they write on paper by hand; they perform on real instruments…the MNS is seen as a technique which is newfangled, that I mean, so far, they rarely relate MNS to creativity.”

*Chinese Composer C*

On the other hand, Western-trained Chinese and European native composers have thought over the interaction between MNS and creativity seriously, either positively or negatively, pursuing the research of how is MNS designed to provoke creativity to most extent.
5.5 Conclusion

In this Chapter I have presented the comparisons regarding to MNS usage among three groups: European native composer, Western-trained Chinese composer, and Chinese native composer. I have drawn the following conclusions from the data:

- Chinese composers should be subdivided into two groups in terms of the education they have received. Composers’ perceptions and compositional behaviours are closely associated with the educational background. Two of the Chinese composers who are currently trained in the UK have presented their interrelated characters which are associated with the other two groups. From the music style to annotation methods, they have combined the properties of both worlds to varying degree of sophistication.

- Usage of MNS by Chinese native composers is seemingly conservative, in compare with European composers. Chinese composers are more likely to have their work done on paper and then conclude onto MNS. Besides, Chinese young composers shape their compositional behaviour through the education which is highly influenced by their mentors. Therefore, the discrepancy between generations is not as significant as European composers.

- Chinese composers, both native and Western-trained, have self-directed spelt out their distress with the facility of editing score. But the latter group emphasize particularly on the frustration caused by the incompatibility issue of Chinese music annotation and Western produced software, rather than the intrinsic defects of MNS. On the other hand, European composers pointed out their unsatisfactory but in the situation of my direction during the interview and questionnaire. But they highly advocate the ability to automatically print parts of orchestra score.

- The sound analogue of Western string instruments and most Chinese instruments
are commonly thought unreal. Therefore composers who are doing composition relevant to both instruments cannot tolerate the sound and rarely use playback even for the purpose of checking score.

- European composers and Western-trained composer have contributed more on the issue of relationship between MNS and creativity. No matter MNS act as a friends or demon to creativity, these composers are spending their effort to find the best way of MNS to contribute creativity. In contrast to this, Chinese native composers are treating MNS as a pure score setting tool rather than taking creativity into account.

- The reason of difference can be from either the nature of music, or composers. On one hand, special features in a music style require particular behaviours of composers on MNS. For example, Chinese music composers appreciate less on the facility of automatically separate parts which is essential used by Western orchestral composers. On the other hand, composers’ own sense, concepts, customs, as well as musical education impact on their behaviours. For instance, Chinese students are highly influenced by their music mentors, both compositional knowledge and process.

In the final chapter I will summarise the findings of my project, and will spell out the limitation of it and recommendations for further research.
Chapter 6 - Conclusion and Recommendations

6.1 Conclusions

This dissertation project has aimed to explore the MNS used by both European and Chinese composers, and to investigate their differences on it. Previous studies of MNS are based on Western musical context and focus on theoretical modelling. Recent research into the users’ perception on MNS has primarily had a Western musical bias, which is somewhat fragmentary.

I have taken a qualitative approach to this study, taking triangulation methods to interview 4 European and 4 Chinese composers, observe their compositional processes, and undertake online questionnaires. According to the data I collected, I have inductively explored how the MNS have influenced composers’ behaviours, on which composers compose, and composers’ attitudes to the packages that they use. Based on the assumption that European and Chinese composer may act differently on MNS due to the different nature of music in each genre, I compared the two groups in details. Although the research involves such a small sample of composers, the divergences derived from the nature of music and composers have been presented. My research suggests the following conclusions:

- Composers are heterogeneous on using MNS, reinforcing and extending the theory made by Eaglestone et al. (2002) that all composers, not only electro-acoustic composers, are a heterogeneous user group. Even the composers in same group, European or Chinese, they define their nature of using MNS differently, have different actions on MNS during compositional processes, and differently change their behaviours during the years of using it. Therefore, unlike Dodge and Jerse (1985)’s definition, the role of MNS in compositional process is different in each case that MNS is observed to be
divergently taking part in each stage of composing.

- The triangulation of methods is generally successful, since each method has compensated the lack of other methods, and is suitable in this qualitative research. Although the sample size is small, composers have adequately revealed their opinions which are unique in every case.

- It seems fragmentary to classify composers into European and Chinese groups because a couple of Western trained Chinese composers have shown their natures which exist in either pure European group or pure Chinese group. Therefore, Western-trained Chinese composers are divided into the third category as a “half-blooded” group.

- Each composer works with MNS that are most suitable and conducive to their individual approach to composition. The nature of using MNS is unique as described by each single composer. Generally, the compositional processes chronologically carry out through pre-MNS stage, MNS writing stage, and revision and sharing stage. Because of heterogeneity of compositional processes, the role of MNS playing, defined by Dodge and Jerse (1985), is challenged and each stage is presented into several patterns. Chinese native composers are conservatively using MNS, comparing with European composers. They are more likely to start writing on paper. By contrast, there are more European composers taking up MNS into compositional processes from the very beginning of work. Western-trained Chinese composers are seemed have endured a transfer from native Chinese group to European group.

- MNS is declared to be a helpful tool to improve the compositional practices, substantiating the findings of Watson (2006). However, physically editing score on MNS, playing the sonic sound by using playback, and obstacle to creativity are highlighted as frustrations.
• Watson (2006) highlighted the some obstructions figured out by composers. However, they are mostly Western bias. I pointed out the different views from European, Chinese-trained and Western-trained Chinese composers on the issues of frustrations. For example, more Western and Western-trained Chinese composers suggested MNS as creative tool, whether positively prompt or negatively obstruct inspiration. However, Chinese native composer are more likely to treat MNS as a pure score setting tool.

• Differences among composers are not only the way they use MNS, or their attitudes towards it, but also the way they participate in this research. For example, although composers from the three groups have indicated the facility of note editing, Chinese composers have spontaneously described the lack of musical symbols in some packages, while Western composers have explained some but in situation of question guidance.

• The reason of difference are from both source: either the nature of music, echoing the comparison of European and Chinese music in literature review, or composers’ own perception and aesthetic sense, reinforcing the discussion by Upton (2004).

6.2 limitations and Recommendations

The implication of this research is limited by the small sample, making it hard to form explicit judgement. Particularly, the interview is undertaken in the UK, where it is hard to contact enough Chinese composers. Therefore I would recommend that the further research in this subject area should:

• Involve a wider sample of composers working with MNS, incorporating with composers doing different music style on kinds of MNS packages.
• Investigate with more Chinese composers who are purely trained in China. In this way of thinking, the research will be more accurate if it is undertaken both in Europe and China.

• Include more detailed exploration of MNS used by composers in the domain.

• Explore the divergences among composers doing different type of music. For example, try to examine the difference between instrumental music composers and chorus composers.

• Illuminate further case studies of compositions, through more detailed observation or retrospective analysis.

(Word count: 19,722)
References


Appendix A – Interview transcript

G-21/07/2009

G: so, what would you want to know?
R: firstly, could you please how many years you do composition?
G: I would say thirty-five? About 35 years, yes, seriously, and not seriously before that. I really started; I try to like thinking about 10. Oh, it seems go to 50 years now. But I don’t admit to any people ….1975. I was a PG student actually, and I was doing composition. And I wrote pieces when I was undergraduate but I don’t take them seriously.
R: what kind of music do you compose?
G: concert music, the music for concert performance, all kind….,
R: Orchestra?
G: Orchestra, chamber music, voice, and about what I haven’t done is about pieces of electronic.
R: but the electronic music is not using notation software.
G: no, the notation software is for instrument, and this is going to be alive musicians of electronics a... offering sounds… There will be some music notation.
R: what software you are using?
G: I use Sibelius. I use it for a very long time. Since we call Sibelius 7. I don’t know the Sibelius history, but the first version is called Sibelius 7 and it run on an acorn computer. This went on some time that you have to have an acorn computer. And the acorn was very nice but they have very small memory. Then what happened was I think a lot of people might change to Sibelius from Finale or Encore. They wouldn’t do it because they had iPod, pc, and they didn't want to buy an acore computer. So eventually, as the Sibelius people…develop program which works on the system. Then they ….Sibelius, just from the beginning, from one, but with the affective program, and about the same time when they develop that. Acorn got in trouble and some really collapse. So a acorn computer will work any more, and couldn’t going way wouldn’t go things. And the only thing you get to people is…… going to Sibelius so far.
R: is it easy to upgrade?
G: you couldn't upgrade the old one. The Sibelius is now on the version 6. I’ve got 5
R: do you use the Sibelius as the only tool to compose or do you write by hand?
G: yes, write by hand.
R: why not just use Sibelius as the sole tool?
G: because if you do that, you will get an idea of a computer one. You can’t be original working into the computer system. You have to working on what you don’t really want to do.
R: do you conclude your writing after the whole composition or after a chunk?
G: sometime. I mean, my working pattern has changed. I used to write anything by hand, oh I can show you about that….this is all written by hand, and written on transparency. And everything is done carefully. I wouldn’t do this; I wouldn't permit to the ink copy until I’m absolutely sure that I have everything is written in pencil. So this would like the step that couldn't go beyond. So I would wait until the whole pieces were finished, and then I would copy the score. And the next thing I would immediately was I copy the individual part also want to transfer, because you know
and need the part, and doing that was very good to me because I shift the school as I did it and I made it absolutely sure that everything was right in each part and then I can correct the score and renew the score on the part correspondence. So that would how I work. I finish the piece of work and the ink version of the score and do the part and everything is perfect. But if you want to revise anything, it's really, it is not necessarily difficult but you need to copy the whole page. It's not good. And what you can do with the Sibelius is to change things immediately and if you can change your mind. Something I change, the bar on length, and you add something or something on your way all thing in format. And they are no problem. So I've got is affected when I finish the piece, I want say it is more like painting picture. You know, painting pictures, the first day, you might get a couple of chambers to paint and you look the things you make and you put it there. And the next day, you come back I do some more. And anybody working in all might finished, but they have to come to a point they would say I would not do it anymore. So I thought it to the habit because the computer is making things flexible. I would put some of music into the program rather than waiting them into pieces. So it's not evidence be way that I absolutely everything into pieces and then I do it, and I copy it. So it is more the working program, and I can change the things in computer what I have. So my pencil copy is looking worse and worse, sometime I found it's hard to read myself. Because it going to the computer era very soon, and we will be able to a media.

R: ok, you said you could revise you composition via the program, how do you think in the traditional way of using pencil on manuscript paper, you are able to read what you did yesterday and make progress, but on program, you can’t.

G: actually in the version 6, you can. So that problem will go. But it is also a problem that I would never want for writing other things to change again and I would really a rubber, so I’m not worry about losing the earlier version, but sometime you would go back to your idea and changing you mind. But I sentiment my decision fairly quickly early on rather than after a long time come back. So I did not need to remember and recall in that way. I don’t find that is a problem.

R: OK.

G: I was talking about broadly working method. And I do know some composers go back to something years later and say that is not right and I must change it. But I tend to get things right quite quickly, so I work slowly. But I’m making decision better than to go. And I tend to not change anything after I compose.

R: when you compose, do you feel happy with entering notes, using plug-ins, and the playback?

G: I don’t have a piano keyboard, and I always use mouse and keyboard. And I’m happy with that. I use many short cut as I can, and I mean the very first time I’ve got the program, I found the best way to learn it was to put piece of work that I written and I did a lot of work in the first week, I never really recover from that because I did a lot of mouse clicking. I’ve never done it before and my finger started tingle, and that’s something I don't like. Never gone. And my right hand feels different from my left because my left hand never does that. I don’t like clicking that much. So I tried to not use my mouse unless I need to.

And Sibelius uses a lot of the small keyboard. So I’d never work with a MIDI keyboard, I know people do, and if you go to a studio, you find people are working in that way. And obviously it is easier to use a shorter keyboard and move things around. But I’m worry about people who play over and over music, because I think the composing is the imagination be allowed to whatever you need to do, I think this is coming back to another of you question about composing act with computer. There is something very easy to do with the program, and that will give you a certain
kind of music which is available to just about anybody using the program but to write your own
music can help you less, let your imagination, go mad. You also have to be able to thinking tend to
what the instrument can do but not necessarily what a keyboard can do. So things are working
nicely on berkly and parallel which may not work properly, nicely to fingers on sheet board so if
you put in keyboard, you will get a keyboard music out.

R: I read from a paper that nowadays, a lot of composers are writing for a program rather than
performance.

G: yes, it's another problem. That the computer can play another …

R: do you use playback?

G: yes, I do use playback. I use to checking the way of my notion, and I’m not making mistakes,
although I make the notes around. it’s a way of the program set up. Oh, let’s go back.

If you write in pencil or in ink, you place the note where you want to know on the page. And in
Sibelius, you might put the note there, but you might copy a part of which have some lines or
some of the rebon . The thing you have to change the note around is because the pitch is different.
So what you hear is something very strange or you hear move the note move around to get the
right one. So it’s a different way of thinking because the program was not necessarily choosing
exactly the note you want. It was choosing a note something you like it and you using it to click
and sometime choosing the wrong note, and turns them into the right place. So when you play a
part of passage, you can change whatever you want.

R: do you think the sound quality of playback is important?

G: I think you have to be aware that the instrument don’t really sound like that. They sound better
that.

R: so you don’t mind the sound, you only care about is the pitch right according to what you hear?

G: it is mostly like that. It gives some ideas about the instrument interact, the balance instrument
can be very wrong. I have to imaging the things about it. I think the system need to be used very
carefully, and a bit of spectacle. You have to know what the instrument really sound like if you
want, that the music need play on them. And if you are making virtual music which is probably in
MIDI music that would never been played in instrument. That would use computer to make CDs,
give it to your friends. That’s one thing. You can get it to do all sorts of things which the
instruments can’t really do. But as soon you make the music into transparency you’ve got
considered what the stuff can do. You’ve got thinking, you know, we play and breath, the
computer doesn’t breathe, the computer can play for ever. And one of my student said: they have
to write more notes than they need to… because the sound of some instrument are thinning, but
core. So the sounds are not really nice. But if you want some sound of string, the sounds are not
very nice as play by string. It’s true of life, but the computer go er….you don’t want go on
listening to that. So you make things more interesting by writing more notes.

R: so the computer is influencing the composition.

G: this is a danger. You have to hear beyond the computer. You have to say I know it not really
sound like that but better.

R: do you use piano to play the true music?

G: yes I do. Again, what I’m writing for instrument is not piano, I’m not hearing piano, I’m just
using it as a way getting notes, to make the context with sound outside of me, so that I can hear
the sound more clearly against each other and to find out them. It is a funny thing to ragging music.
It’s very strange. Try to tell people what the note can play. At the same time to someone else to
make it sound. It’s a strange predation. You have to tell them what the notes are, you have to close if possible, identify the notes, how long it goes and how loud you play it. And they are all relative things. Here it is too loud, but I can’t tell you exactly how loud. Things like that which would players can negotiate on the computer by typing them for loud, and give you kinds of standard level identified. You can get inside the program you can play around about bits more. But of course I think somebody didn't have experience working via the instruments, they wouldn't have had the knowledge about how to do that. It’s good, but we shouldn't trust it too much.

R: is there young composers only use program when they do compose?
G: I think they do. A colleague of mine in Manchester says they if they compose on computer, they would cut their hands off. He felt so strongly that it is not good for them to write on computer. Because of the reason I suggest to work on different reason. But another thing it gives experience was like performers. When that happens, the players will soon tell what they can do and what they can’t do on the instrument. And practical things like how much time you need to turn the pages and that sorts of things. You do need to think about these things. They are all practical, some of them the musical but some of them are not like that. But some of them are not. How do I need to do this? Or, let’s say, you have to take the mute on the instrument. How long is that take you do this. Because you can assume that you can do it very quickly. If you look at the tuba, you will find the hand work is very heavy...Without physically use the instrument, you can’t make out such of things. Also, it need more time to pull them or than put it down.

R: about the playback, do you listen to it after the whole work or only after a piece?
G: I guess I listen to the whole things. I would say some composers they would never listen to the sound.
R: never?
G: never, because they don’t want to hear it. But I found actually that there was a time, when for some reason I couldn't get my sounds work. So I had to “look” into the sound of my score all the time, just to make sure everything is absolutely right.
R: but I think for those composers who are lack of experience, they can’t “read” what the sounds like. Maybe they have to listen to the sound and get immediate understanding.
G: I would like to say the Sibelius helps you to be able to edit the score; there are people who based on the opposite they can’t compose without the computer anymore because they have to rely on the computer giving you sound. I think the context of having the score and hearing the notes, I think it tend to make the completed your mind better. At the same way, it’s just like playing on the instrument and put it on the piano like. I think it helps the associate the sound the tune of instrument, but all I’m saying is when I couldn't get the sound I found I become so relying on hearing the note and shef they were all slice. So I did not have to found. I wouldn’t have to check much more to make sure everything goes well. So for me it’s very helpful. What I did used to before was to guess the pace will be and to decide the exact speed what you want things to go out, and how long a section will be and relationship to each other. It’s about the pace and the time, without thinking the sound is really like a real bell or violin. So I’m not really worry about that. So to playing all the score can be very useful.

R: In general, do you think the program is only a score setting tool or it can also stimulate the creativity?
G: I’m afraid I think it is a danger to reducing the creativity, because it is very easy to produce what you thought very quickly. It’s very easy to produce very fast file in an easily produce result.
That’s a danger. I see some music which was written by not very musical people. You know, it was anybody can get easily from a computer. But we have to use our imagination, and by copying things moving them around into the computer. But if you not imagine you can’t do anything. That’s interesting. I think it was not about program, it’s about instinct ion. And my view and somebody being using it a long time, from almost the earliest version with they work. That’s what I concerned for, a good way to notating music: clearly, efficiently, and quickly working into parts produce without have to working at it as well to respective high quality, clean them up. The idea of the sound come with it is going to the third place. I think it is kinds of bonus, when you got the sound, you can get the feedback of your sound. People are learning new piece and said: oh you send me the part of Sibelius, you must have the sound. Can you send me a MIDI file? Then they start to learn in it from that, rather than from the note. I don’t really want them to play from that. I think the development to think the later for Sibelius is more to improve the sound. That’s interesting of that. I tend to wait a long time before I upgrade. First of all because the new versions are always bunk and I have to tell somebody else to fix up it; and then I’m reluctant to upgrade I don't know how well they know the different way of the Sibelius. I didn’t actual get into the … move from …and I strengthen them forward and it took me a long long time to move to this side. It’s only when the system here, what I upgraded the file for I’ve got a computer here for people would give you files on the 5 and you read them at home. But I didn’t feel the step from four to five was so great, it’s really about do it in a hurry. Four already give me all I needed, five may be giving me more interesting sound, but it’s not my priority.

R: so what is the most priority?

G: the priority is not much the sound like; it’s the appearance of the score.

R: so you regard the Sibelius as a score setting tool rather than a creative tool.

G: That’s what I got on the first place. And I think the sound is on the second place although it is useful.

R: how do you think any other functions in the Sibelius?

G: I don’t use any the things like arranging. The things I do worry about, like harmony, to typing a line, and use the harmony, it harmonize as well, to harmonize, to point, it’s not very interesting you know. It’s obvious the things the stupid computer will do.

R: so you never use computer to arrange the structure of your composition?

G: no, no, never. These kinds of shortcut, I’m not interested in at all, but I don’t even know where they are.

R: have you ever used other package such as Finale?

G: no I didn't. I saw an early demonstration of the score, it was very interesting, that was … development the score. But it was early version and everything seems….to pick them forever input. And I saw something is also coming, eventually, something will be useful. I did have an experience with an American composer for two weeks for the university. He demonstrated the system he has but I can’t remember what it was. But he improvise on his keyboard about 2 hours a day, and …half it. … half an hour working on it. And he capture half an hour on composing every day. And there are people from America saying here was keyboard PC to arrange this for practical. You know, something like … which has 5 parts, but with on 3 pieces or 3 keyboard, and I put the things into computer, and he has applications which is called explode, what was picked the part and put them out onto five separate line. So when instrument…concert translate section1, section2, for example. And then they send them back by email and arrange it for him. You have to listen to
the pieces, and all you could do is put them into the computer, the applications to back or they could do by themselves. There is no relationship involved in that … should I … a little bit to lower part, or should I cross the part to make them more interesting for them. Because they become more open … through the program, the part are somehow actually can let them interesting to play than they would be alive, you know the real relationship mind of work, making decisions. So I’m worried about it although things are becoming open… and become available to people are in relation. It’s good, but I think some of the things I built into the program maybe they shouldn’t be have done. I mean if you look at an article on internet, and if you come into the language you can’t read you translate. You get something which is bought to make sense but it’s not really the person done it. That’s what I think is a music equivalence.

R: how many years you adopt Sibelius?
G: I got from middle of 90s, about 15 years, probably.
R: was it introduced by your colleague?
G: yes I think so. He email he has known it, then I saw the Sibelius demonstration and see them do this. And say, yes, this is a fine option. And then I use it. I’m not tending to do any awful things I’m doing, I will be responsible. So you do have to be very …
R: so the pressure from you peer made you use the program?
G: I don’t know, I think just impatiently, to get things quickly. And you will find this is a solution because the computer will give it to you. But it’s not the necessarily best way. I like it to be responsible if you knowing you can copy a passage and change the details. But a lot of people they would just copy the passage and play it again. So get the music really repetitive and doesn’t change much. Because the decision you making a too large level, that really the music work and play it again… half of this was same and half of them be new. Or… if you write by hand, you will be thinking about it.
R: and it more likely to be of new?
G: yes. And I used to heard from Helson… a British composer, but he says, I think I believe in, he said if you want to repeat something in synthesis, he doesn’t just take pages and copy that, what he does is he has the page of music but he has before and he turns it over. And he copies it from memory. So that it will change, and his brain, in some way will change it. So it’s many that repetition, I asked the very strange process because he head in using the principle of forgetting apart of his way together. But a computer can’t really forget. We can delete if you wanted to, but it can’t forget its creative way.
R: Generally, do you have a positive or negative attitude toward the program?
G: you mean do I like to use it or do I have fears about it?
R: yes
G: I will say in both ways then. I like the program and I find it is very useful. But I do know I have to be careful about it and I do know… patient. But I have to avoid. And something I don’t like it, is my student do it. But I wouldn’t cut their hands off. If they write on computer, I wouldn’t encourage them to write music by computer because it’s not the best way to do it.
R: so you recommend them to write by hands.

G: yes, you see I’m a composer who spent years writing things by hand, including doing the preparing parts they could use. And those sorts of experience you have at least … I have because you get to know how to get best outcome of the computer. Because you need to bring that sort of experience, if you go to straight into working with the computer, you will never get that
experience. You will always get the computers doing these things for you. So you really need to know what the best decisions are, and tell the computer what you want. I would say, as the department like, we encourage people to use it of course, because it makes easier to read most people’s hand writing. But I think we would encourage as much liking music as possible, in direction between players and composers. So the composers know how the players think about it. And every instrument is different and in different approach. So you need to know how difficult of the instrument work and how they play it… tiring, or involved amateur, or the players. It’s easy to…on instrument. There was something was very easy on violin but on the keyboard it’s difficult to do. And also the practical interact in tempo, just what the pace looks like. How about the computer…there are so many things a line, instead 3 bars in a line, you have …because of the flex of information…to …much more. So I would say we use the Sibelius, but we keep the traditional approach to preparing performance alongside that. So they get their experience on work their way as well.

R: ok, thank you very much for your time.
Appendix B - Questionnaire

MUSIC NOTATION SOFTWARE (MNS) AND COMPOSITIONAL WORKS

I invite you to complete the following questionnaire to help me with my PG research. This questionnaire is designed to gather information that will provide a picture of the relationship between composers and MNS. Another version in Chinese with generally same questions is posted to Chinese composers. I would like to investigate the difference between Chinese and European composers on use of MNS. The result of questionnaire yield will provide very valuable data for my PG dissertation. Please complete this questionnaire with careful consideration. And keep in mind that the answers you give will remain private, and will be only used for the purpose of my research.

1. You have been composing for __ years?
   a. Less than 1
   b. Between 1 to 5
   c. Between 5 to 10
   d. More than 10

2. Please point out the music type of your composition.

3. Do you have music education background?
   a. Yes
   b. No

4. How many year from you first use MNS?
   a. Less than 1
   b. Between 1 to 5
   c. Between 5 to 10
   d. More than 10
5. Please select the MNS you are using
   a. Sibelius
   b. Finale
   c. Encore
   d. Others, please specify____

6. How many years you have been using it?

7. Which notation style do you use?
   a. Staff musical notation
   b. Numbered musical notation
   c. Others, please specify__

8. What led you to adopt MNS in your work?

9. Please select the nature of your compositional use of music notation software
   a. Notation software is the only tool for releasing new compositions
   b. Use notation software in conjunction with the piano or another instrument
   c. Use notation software in conjunction with writing by hand on manuscript paper
   d. Conclude the hand writing on MNS, it is just a typeset score tool
   e. Others, please specify__

10. Please explain your compositional process.
    For example: 1—write score by hand, 2—enter score by using MNS, 3—playback, 4—modify...

11. In reference to the previous two questions, how, if at all, has your use of MNS changed in the time you have used it?
12. Please evaluate the function of entering notes and musical annotation
   a. Very unsatisfied
   b. Unsatisfied
   c. Natural
   d. Satisfied
   e. Strongly satisfied

13. Please indicate what do you think should be improve to enter a note or music annotation.
   a. There are annotation signs not applicable in the MNS.
   b. Some annotation sign are difficult to find out
   c. It is hard to edit some annotation signs on the score
   d. The space between scores are difficult to adjust
   e. Others, please specify__

14. Please evaluate the function of audio playback
   a. Very unsatisfied
   b. Unsatisfied
   c. Natural
   d. Satisfied
   e. Strongly satisfied

15. When do you play back through you composition?
   a. Shorter than a bar
   b. After every single bar
   c. After a chunk
   d. After the whole composition
   e. Others, please specify_______

16. What influence does playback have on the compositional decision you subsequently make?
   a. No influence
   b. A little influence
   c. Some
   d. Quite a bit
   e. Very much
17. If you think playback has impact on your compositional process, please explain how does it happen?

18. Do you think the sound quality of playback is important to you?
   a. Yes
   b. No

19. Do you regard MNS as
   a. A score setting tool
   b. A creative tool
   c. Both

20. Have you ever adopted other MNS? If yes, please specify the name and the reason for you abandon the previous ones; if No, please explain the reason of royalty.

21. Compare with composition by hand on manuscript, what do you think the chief advantage and disadvantages of using MNS?

22. On the whole, has the use of music notation software impacted on your compositions positively or negatively?